

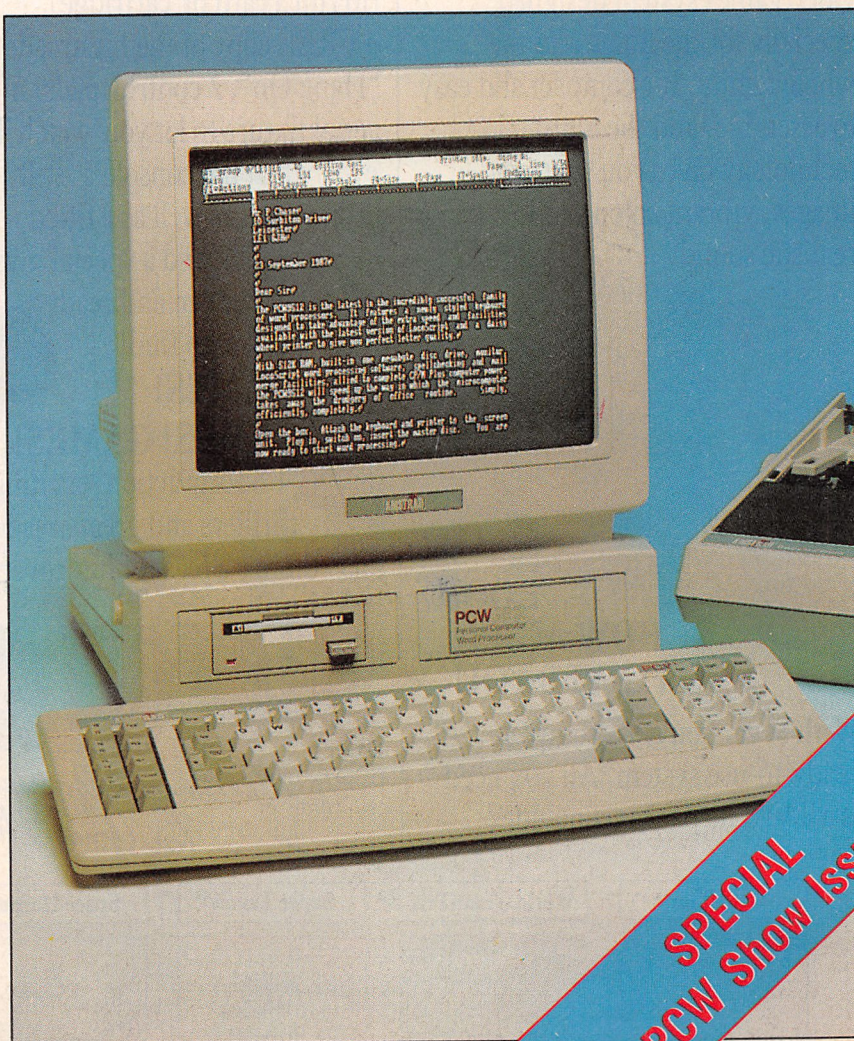
POPULAR Computing WEEKLY

Amstrad PCW 9512 review inside

NEWS DESK
Spectrum
price cuts

SOFTWARE
ST Basics
compared

PCW Show
Floor plan
and stand
guide inside



SPECIAL
PCW Show Issue

SEGA

THE ULTIMATE HOME VIDEO ARCADE MACHINE



This is SEGA – the powerful new video games system designed specially for the home and the whole family. It's compact and easy to assemble, and the high technology gives you sharp video images, vibrant colour and realistic sound!

games console (to run a card or cartridge), a FREE copy of the hit arcade game "Hang On", 2 control pads, a TV aerial fixture to let you watch TV even when the console's still connected as well as a fitted 3-pin plug and a special mystery game built-in and ready for you to find!

256k cards! And Sega has 1 megabyte and huge 2 megabyte cartridges to take the 40 new titles coming your way later this year including smash hits Out Run, Space Harrier and many more.

SEGA GIVES YOU ALL THIS FOR JUST £99.95!

GAMES!

GAMES! GAMES!

Sports action, exciting thrillers and great arcade hits – there's a feast of fun covering



LIGHT PHASER

Take aim and fire at your targets with ease – and stunning realism!

3-D VISOR GLASSES

Get more out of your game – More force, more action and more amazing 3-D realism!

SEGA

The Ultimate Games Machine For Your Home

LOOK HOW MUCH SEGA GIVES YOU

With Sega, you get a complete, ready-to-use system. All you need is a TV! The package includes

Choplifter™



World Grand Prix™



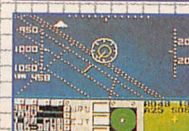
Super Tennis™



Space Harrier™



F16 Falcon™



Out Run™



Sept 25-Oct 1

CONTENTS

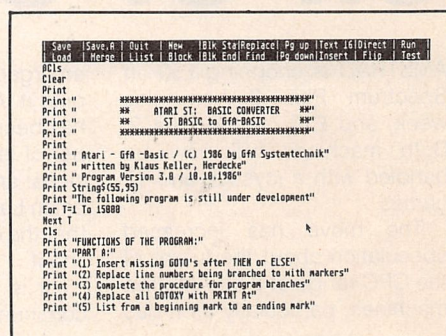
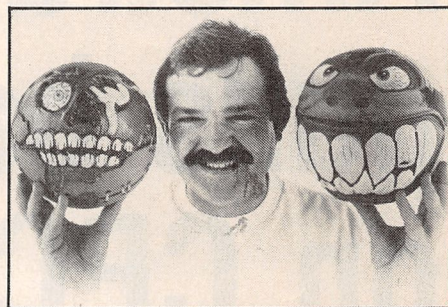
POPULAR
Computing
WEEKLY

News

4 News Desk Amstrad cuts prices on the Spectrums.

32 PCW Show Floor Plan

45 Communications Steve Gold returns with detailed advice to modem users on how to save money on those massive phone bills by using the Mercury Communications telephone service.



Features

15 ST Basics Duncan Evans casts a jaundiced eye over four competing Basics for the Atari ST, and offers his recommendations.

18 Amstrad PCW 9512 The new Amstrad wordprocessor is one of the stars of this week's PCW Show. Ian Rook puts Joyce 2 through its paces.

Programming

26 Sound Effects Kenn Garroch concludes his four-part series on sound generation with advice on digital converters and speech.

28 Listings *Newsmaker* on the CPC, *Phoenix* on the Spectrum.

44 Bytes and Pieces Short routines for you to type in.

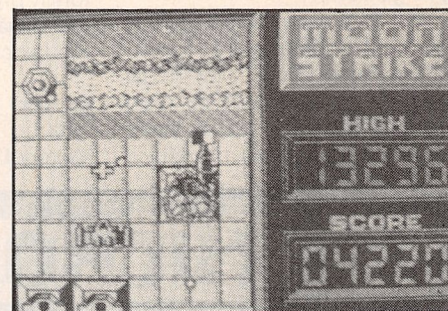
22 Peek and Poke Kenn Garroch answers your programming queries.



Top: Amstrad CPC. Second: Fast Basic. Above: Super Sprint. Below: Moonstrike.

Games

58 New Releases Your complete guide to all the programs released this week, including *Moonstrike*, *Enterprize* and *Elite's Six Pak*...



Executive editor Francis Jago **Deputy editor** John Brissenden **Features editor** Cliff Joseph **Technical editor** Duncan Evans **Marketing manager** Jeremy Kite **Advertisement manager** David Osen **Advertisement executive** Athena Peerman **Classified manager** Susannah King **Classified executive** Robert Cole **Editorial secretary** Annmarie Allan **Managing editor** Brendan Gore **Publisher** Trish Phillips **Group Publisher** Paul Coster **Chief executive** Richard Hease **Financial director** Brendan McGrath. **Published by** Focus Magazines, Greencoat House, Francis Street, London SW1P 1DG. **Typeset by** Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. **Printed by** McCorquodale Magazines, Andover, Hampshire. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643.

© Focus Magazine 1987. ISSN 0265-0509

ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Popular Computing Weekly. Tel: 01-834 1717.

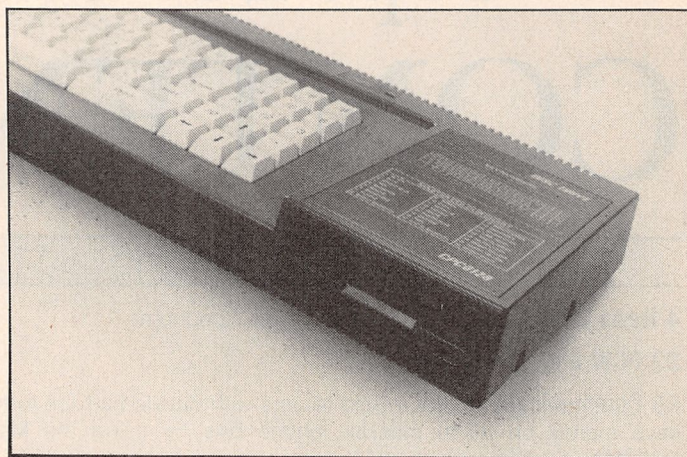
Amstrad pulls back on CPCs

AMSTRAD is chopping £50 off Spectrum Plus 3 from this week, and £10 off the Plus 2. Both machines will now be bundled with a joystick and 17 games.

The move has increased speculation about the future of the CPC range of 8-bit Amstrad machines, particularly as it has

emerged that WH Smith is dropping it. Advertising for the CPC has been cancelled with a number of leading computer magazines, and WHS computer buyer Ian Laurie admitted last week that the chain is no longer handling it.

"It is not a line that we will continue selling," he said.



CPC: dealers say demand is holding up.

The future of the range has been in doubt for some time.

An Amstrad spokesman denied that the cuts have been made in response to trade pressure and described the an-

nouncement as a "commercial move". He said he had no information on the future of the CPCs.

The Plus 3 now sells for £199, while the new Plus 2 is £139.

Teleconference doubts

MICRONET is soon to introduce a tele-conferencing facility, for 'private' or 'closed group' discussions.

The facility will work with both viewdata and 80-column scrolling formats (another new addition to Prestel's features) and will be available on a pay-as-you-go basis.

But recent allegations by the likes of Independent Television's Roger Cook over illegal use of bulletin boards for child pornography contacts, have raised doubts about the ethics

and the legality of a 'closed user group' where topics of conversations will not be dictated.

David Rosenbaum, Micronet's Marketing Manager understood the possible difficulties, but commented:

"Conversations that take place in locked rooms will be totally private and confidential - that's part of the attraction of the teleconferencing system."

● Next week *Popular* will be looking in more depth at Micronet's new developments.

GST launches Desktop Publisher

AT A press launch last Wednesday, GST showed off their latest product, *Timeworks Desktop Publisher*. Available in England from November, there will be an Atari ST version costing £99 and a version for the Amstrad PC and compatibles, the price for which was undecided at time of going to press.

GST's Chris Scheybeler pointed out that the company had a good background in the area, with their programmers having written the *First Word* suite of word processors as well as producing specialist software for electronic typesetting systems used by local and national newspapers.

At a sneak preview before the official press launch, *Popular* had a chance to see the program and its extensive list of features. One advantage over the competition will be the wealth of printer support, with drivers already written for nearly all 9 and 24 pin matrix printers as well as Postscript and HP Laser printers, and the option of sending postscript files to disc for professional typesetting. No software currently supports the Atari Laser printer because Atari have yet to confirm the specification, but GST promise one soon.

Being based on the GEM operating system, *Timeworks*

will be fully menu driven with optional "short cuts" to duplicate menu commands for those who prefer to leave their hands on the keyboard. GST in the past have written "mouse only" software.

A sophisticated graphics editor, similar to *Easy Draw*, will be included within the main program to create either stand alone illustrations or to embellish imported pictures. So far the programs that *Timeworks* will support include all those producing GEM format files (*GEM Draw*, *GEM Paint*, *Easy Draw*, etc) and *Degas Elite*, *Neochrome* and *PC-Paintbrush*. A superior picture manipulation facility is promised, to alter picture size without the usual distortions.

Text can either be entered directly or be prepared on a separate word processor and imported. Text can be imported in either ASCII, *WordStar*, *First Word* or *Word Writer* files.

Other features include automatic hyphenation and frame rejection, so that if a block of text has a picture placed over it, the software will automatically reformat the area. GST had yet to decide on the number of fonts, but said that at least there would be a Times look-alike and a few special headline fonts in the larger point sizes.

MICRONET (C)
800a
Op

MICRONET

Keying
*O#
from
any
page
will
always
take
you to
your
front
page

- 1 News and Comment
- 2 Microbases
- 3 Communications
- 4 Software
- 5 Prestel Focus
- 6 Games and Entertainment
- 7 Teleshopping/Advertising
- 8 Business & Consumer Info.

What's New Today: Key #
FULL A-Z INDEX: Key 01

Key 9 for a message from Micronet

HELP? Key 0 from any page

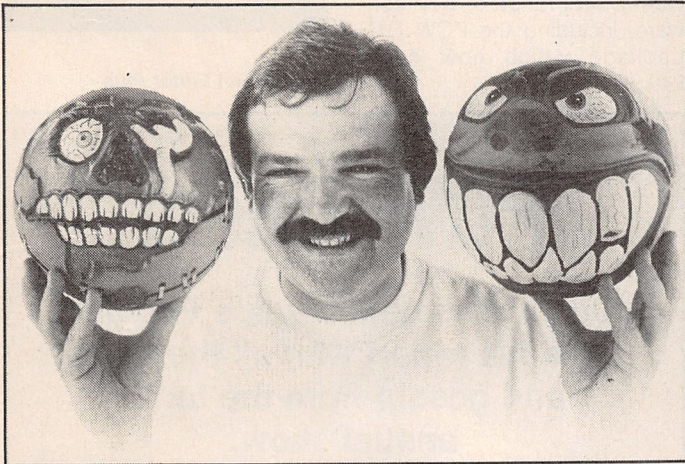
Balls go bananas

OCEAN Software have acquired the rights to produce a computer game based on the Madballs range of toys.

Pictured is Ocean Director Jon Woods and two of the Madballs, which are produced by American company TCFC (Those Characters From Cleveland) Inc. In the game you will

play the part of Dustbrain, a sort of Madball Thatcher, whose aim is to eliminate his political opponents, Screamin' Memmie and Slobulus, by controlling the planet's supply of cabbage and fish heads.

The Madballs game will be released in December for Amstrad CPCs, C64 and Spectrum.



Popular needs a Staff Writer

POPULAR Computing Weekly needs you! We have a vacancy for a Staff Writer, and you could be the right person for the job.

The position will involve writing copy for our news pages, as well as helping out on the rest of the magazine with features, reviews and interviews.

Knowledge of the home computer industry is important, but so is the ability to write, learn quickly, work to tight schedules, and fit into a small, friendly

team. The ideal candidate will be young, enthusiastic and looking for his/her first steps into an exciting career in computer journalism.

Salary will vary according to age and experience.

To apply send in your CV, together with details of relevant experience to: Francis Jago, Executive Editor, Popular Computing Weekly, Greencoat House, Francis Street, London SW1P 1DG.

SOFTWARE HOTLINES

Dilemma:

A well known software house sends you a press release about their next release, based on some daft boardgame.

Do you chuck it in the bin and forget all about it, and risk upsetting the company (thereby missing out on lunch at the PCW show), or do you praise it to the skies?

This is the sort of problem you'll have to face if you buy *Scruples*, the computer version of the well-known boardgame being planned by **Leisure Genius**.

The game has over 200 questions, all of which allow you to drop someone else in the merde, and if you can't find anyone willing to play the game with you then the computer has 64 preprogrammed personalities that you can play against.

Virgin Games (which owns **Leisure Genius**), has given up basing games on the real-life (?) adventures of Richard Branson, and have decided to license the rights to the *Action Force* range of toys, which is probably a good move. And, at this very moment a copy of their *How To Be A Complete Bastard* game is biking its way to me, so there'll probably be a review in next week.

Does anybody out there remember the fuss that we all used to make just before the release of a new **Ultimate** game? Well, **Mastertronic** have just acquired the rights to rerelease **Ultimate's** old titles on their Ricochet budget label. So now games like **Knightlore**, **Alien 8**, and **Sabrewulf** which

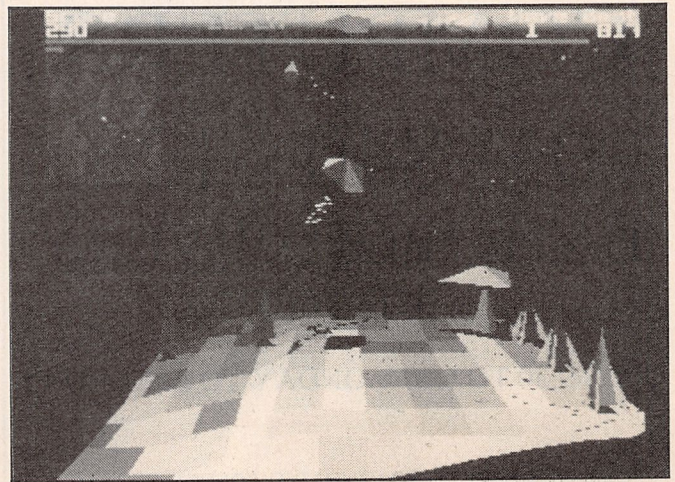
probably got more rave reviews for **Ultimate** than any other games in the history of the universe, can be yours for just £1.99.

Having tied up James Dean for a licensing deal, **US Gold** has also added Sir Charles Chaplin to their stable of stars. They've come up with a game in which you have to choose a script for a silent movie, then cast it and gather together all the props and scenery. The action in the film is made up of arcade sequences that you take part in as the Tramp character, and you play these back to edit them into a complete film for release in the cinemas, with your score depending on the audience's reaction. It all sounds very odd (US Gold keep using the word 'concept', which is always worrying).

Also at the show will be **Zarch**, **Superior's** new Archimedes game that we mentioned recently. We can now let you have a look at it with the nice little screen shot below. The Archimedes is also about to get its first graphics package, in the form of *Artisan* from **Clare's Micro Supplies**. The machine isn't in the shops yet, but there's already more software for it than for the +3 Spectrum.

More news of **Hewson's Magnatron**; this is Steve Turner's follow up to *Quazatron* and features the continuing adventures of the KLZP 'droid - this time onboard a space station, where it has to destroy a number of nuclear reactors. There's a screen shot above (to make up for the upside down one that we had on last week's cover, and for the screenshot of a non-Hewson game in a recent **Hewson** review. Sorry about that, Andrew).

Cliff Joseph



More news
on
pages 6 & 11

NEXT WEEK

Date with danger

Popular Computing Weekly has achieved the near impossible and obtained an audience with Alan Sugar.

Is Amstrad dropping the CPC Range? Will there be any more new models? What is to become of the Spectrum range? All these questions and more will be answered in next week's interview.

The big three

Can the Acorn Archimedes really compete with the likes of the Commodore Amiga and Atari ST?

In this full test, *Popular* looks in depth at these three machines and draws some controversial conclusions.

The Mild One

Is Bill Stealey, the President of Microprose, really as 'wild' as everyone makes out? *Popular* met the man behind the mouth and drew some surprising conclusions.

PCW News

The show may be over, but the reports go on. *Popular* will not only bring you the first full report of the show, it will also be the most complete.

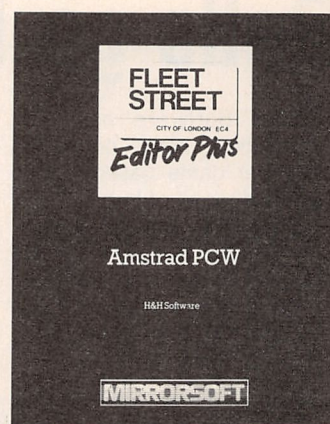
Pages dedicated to 8 and 16 bit software, as well as news and views on the latest hardware from the show.

Popular will, as always, be the magazine that gives you the low-down on the latest developments.

Deep pockets

MIRRORSOFT has announced a deal with W H Smith to display DTP packages in its top fifty stores, and has slashed the price of *Fleet Street Editor Plus* by £20.

The selected outlets will be stocking the whole Mirrorsoft Fleet Street range of DTP software, including the PCW DTP package which now costs £49.95.



Fleet Street Editor Plus

PCW Show

Don't miss next week's *Popular* for a full report with all the news and gossip from the tenth annual show.

WHY VIST THE PCW SHOW

WHEN YOU CAN SEE OUR COMPUTER SYSTEMS FOR

FREE

Computers, Modems, Printers, Cables, Disks, Disk Boxes, Software, Books, Desks, Ribbons, Paper, Labels, Cleaning Kits, Dust Covers and Repairs

TRI COMPUTERS

01-840 6136

LATE NIGHT EVERY NIGHT

OPEN 9.30 TO 6.30 MONDAY TO SATURDAY

161-169 UXBRIDGE ROAD EALING LONDON W13 9AU

WE ARE . . .

A NEW INDEPENDENT LABEL WITH INTERNATIONAL PUBLICATION AND DISTRIBUTION BACKING

ARE YOU . . .

ABLE TO TAME UNRULY Z80 AND 6502 MONSTERS AND MAKE THEM PLAY GAMES

WE WANT . . .

HUMAN BEINGS WITH A SENSE OF HUMOUR WHO ALSO JUST HAPPEN TO BE BRILLIANT PROGRAMMERS



"IF YOU'VE GOT THE TALENT - WE'VE GOT THE DOSH!"

PHONE 01-340 8785

OR WRITE TO PAUL SMITH

VIZ DESIGN: 28 LANGDON PARK ROAD LONDON N6 5QG

GLENTOP

GFA BASIC



The GFA Family

From image processing to
compiling BASIC . . . from
crunching numbers to
desktop publishing . . .
from 2-D draughting to
film creation . . .

GFA is the link



NEW PRICE
£45.95
inc. VAT
EACH

GLENTOP

Glentop Press Ltd
Freepost
Barnet
Herts EN5 5XE
Tel: 01-441 4130

NOW AVAILABLE

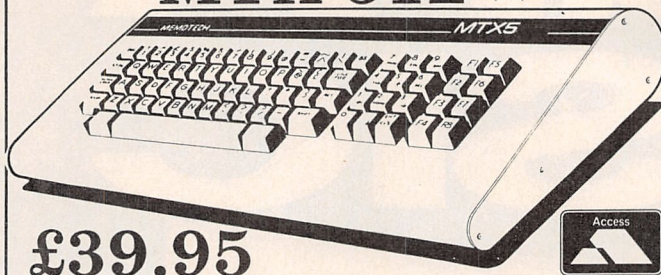
GFA VECTOR

GFA Vector is a powerful 3-D Graphics package, which can be used either as a 'stand-alone' design and manipulation program or, more powerfully, as an extension to GFA BASIC. GFA Vector enables three dimensional graphic images to be created and manipulated in 'real-time'. Extensive design facilities are provided for the creation of almost any imaginable object. Using the interactive 3-D Graphics Editor objects can be created, viewed and altered dynamically. The Editor allows objects to be defined in two ways; either in terms of co-ordinates or, more easily, by means of the 'triple-window' screen using the mouse to draw the object in each axis.

£34.95 inc. VAT

Available from computer
shops or direct from
Glentop.

★ MEMOTECH MTX 512 ★



£39.95

Plus £3.05 postage (total £43)

- ★ 64K User Ram ★
- ★ Z80 Processor ★
- ★ 3 Channel Sound ★
- ★ 16 Colours ★
- ★ Extensive Software ★
- ★ CP/M 2.2 Adaptable ★
- ★ Fully Guaranteed ★

☆☆☆☆☆☆☆☆☆☆

Further details/orders to:

UK HOME COMPUTERS

82 Churchward Avenue, Swindon, Wilts SN2 1NH

Tel: 0793 695034

SPECIAL THIS WEEK

NEW COMPUTERS

Spectrum 128.....	£79.95
Commodore Plus 4.....	£59.95

POWER SUPPLY UNITS

Spectrum 48.....	£5.95
ZX81	£4.95
Commodore Plus 4.....	£12.95
Electron.....	£12.95
Mains adaptor 3, 6, 9V switchable in red or green	£3.95
Trojan light pen for PCW now at	£29.95

Disc Drive for the BBC
ONLY £74.95

See us on Stand 3040 at the PCW Show

DRAGON

Dragon joystick interface	£4.95
Send for our free catalogue of games from only £1.99	

All our prices include VAT and postage.
Visa and Access

R. & A. J. PRESTON

King's Hall Court, St. Brides Major,
Mid. Glamorgan CF32 0SE
Telephone: 0656 880965 (24 hrs.)

Dept. P.C.W.



Castle Computers



NOW
TAKEN

CASTLE HOUSE

11 NEWCASTLE ST.

BURSLYM

STOKE ON TRENT

Tel: 0782 619159 Ext 25

Spectrum Special Offers:

	RRP	OUR
Zynaps	7.95	5.50
Gunships	9.95	6.95
World Class L'Board	8.99	6.50
City Slicker	7.95	2.99
Pyracurse	7.95	2.99
Thanatos	9.99	2.99
Fat Worm Blows A Sparky	9.99	2.99
Sigma 7	9.99	2.99
Deep Strike	9.99	2.99
Now Games 3	9.95	3.95
FA Cup Football	7.95	2.99
Virgin Challenger	7.95	2.99
Sorgery	7.95	2.99
Strangeloop	7.95	2.99
Falcon Patrol II	7.95	2.99
Ice Works	—	2.50
Krackout	7.95	3.95
Snooker	—	1.99
Sorderon's Shadow	9.95	2.99
Danger Mouse In D Trouble	—	1.99
Evil Crown	9.95	3.95
War On Want	9.95	2.99
Enduro	9.95	2.99
Sky Runner	9.95	2.99
Orbit Terrorball	9.95	2.99
Acro Jet	9.95	3.95
Prodigy	9.95	2.99
Nexor	9.95	2.99
Cyberun	9.95	1.99
Avenger	9.95	4.95
Gauntlet	9.95	4.95
Buck Rogers	9.95	2.99
Dan Dare	9.95	2.99
Zorro	7.95	2.99
The Boggit	7.95	2.99
Five Star Games	9.95	5.95
The Young Ones	9.95	2.99
Boulder	7.95	2.99
Trail Blazer	7.95	3.95
Mantronix	7.95	1.99
Army Moves	7.95	5.50
Tai Pan	7.95	5.50
Short Circuit	7.95	5.50
Slap Fight	7.95	5.50
GFL Football	7.95	5.50
Game Over	7.95	5.50
Convoy Raider	7.95	5.50

Spectrum Special Offers:

	RRP	OUR
Living Daylights	9.95	6.95
Quartet	9.95	6.95
Catch 23	8.99	6.50
Hit Pack II	9.95	6.95
Hit Pack Trio	9.95	6.95
Bismark	9.95	6.95
Vulcan	9.95	6.95
Rode Runner	8.95	6.50
Last Ninja	8.95	6.50
Barbarian	9.95	6.50
Silent Service	9.95	6.50
10 Mega Hits	9.95	4.95
Sweevox World	7.95	2.99
Wonderboy	9.95	6.95

We are moving to larger premises shortly and must clear the following stock quickly, hence the silly prices! Please state an alternative if not phoning first!

Spectrum Special Offers:

	RRP	OUR
Sentinel	9.95	6.95
Strike Force SAS	9.95	3.95
Livingstone	8.95	6.50
Hydrofoil	7.95	5.50
Info Eagles Nest	8.95	6.50
Little Computer	9.95	6.95
People (128)	9.95	6.95
Now Games 4	9.95	6.95
Star Games II	9.95	6.95
Scalextric	9.95	6.95
World Games	8.95	6.50
Zulu War	9.95	6.95
Paperboy	7.95	5.50

C64 Special Offers:

	RRP	OUR
World Class Leaderboard	9.95	6.95
Slap Fight	8.95	6.50
Last Ninja	9.95	6.95
Barbarian	9.95	6.95
Quartet	9.95	6.95
Gunship	14.95	10.50
Army Moves	8.95	6.50
Living Daylights	9.95	6.95
Game Over	8.95	6.50
Convoy Raider	9.95	6.95
Movie Monster/World Games	9.95	6.95
Wonderboy	9.95	6.95
Rode Runner	9.95	6.95
Hit Pack II	9.95	6.95
Hit Pack Trio	9.95	6.95
Silent Service	9.95	6.95
Epyx Epics	9.95	6.95

C64 Discs:

	RRP	OUR
World Class Leaderboard	14.99	10.50
Last Ninja	14.99	10.50
Colonial Conquest	19.95	14.50
Wizards Crown	14.95	10.50
Auto Duel	17.95	14.95
Gunship	19.95	14.95
Battle L'uiser	24.95	19.95
War In South Pacific	24.95	19.95
Pirates	19.95	14.95
Guild Of Thieves	19.95	14.95

OUR PRICE

	RRP	OUR
Revs+	5.95	
Tiger Mission	3.99	
Iridis Alpha	2.99	
Mission Ad	3.95	
Parralax	3.95	
Mission Elevator	3.95	
Hot Wheels	2.99	
Super Cycle	4.95	
Shoolins Roads	3.95	
Yie Ar Kung Fu II	3.95	
Breakthrough	3.95	
Howard The Duck	3.95	
Sanxion Thalamus	3.95	
Paradroid/Uridium	3.95	
Sentinel	3.95	
Aliens	3.95	
Lepand Of Kage	3.95	
Super Huey II	4.95	
Escape Sings Castle	4.95	
Leviathan	3.95	
Firetrack	3.95	
Tag Team Wrestling	3.95	
The Vikings	2.99	
Thing Bounces Back	3.95	
Rana Rama	4.95	
Archon II	1.99	
Ball Blazers	2.99	
Nodes Of Yesod	1.99	
W Series Baseball	2.99	
Glider Rider	3.95	
Law Of The West	2.75	
PSI 5 Trading Co	2.99	
Cobra	3.95	
Now Games III	3.95	
Transformers (Activ)	3.95	
Warrior II	2.99	
Bored Of The Rings	2.99	

THE ABOVE MUST BE SOLD OFF
BEFORE WE MOVE TO BIGGER
PREMISES!
BE QUICK FOR THESE

Amstrad Special Offer:

	RRP	OUR
Asphalt	9.95	6.95
Living Day Lights	9.95	6.95
Paperboy	9.95	6.95
Rode Runner	9.95	6.95
Wonderboy	9.95	6.95
Barbarian	9.95	6.95
City Slicker	8.95	2.99
Impossaball	9.95	2.99
Now Games 3	9.95	6.95
Virgin Challenger	9.95	2.99
Galvan	8.95	3.95
Ikari Warriors	9.95	4.95
Firelord	8.95	3.95
Breakthrough	8.95	3.95
Super Cycle	9.95	4.95
Dandy	9.95	2.99
Aliens	9.95	3.95
Tarzan	8.95	3.95
Highlander	9.95	3.95
Iedelon	9.95	4.95
Xenious	8.95	4.95
Dragons Lair	8.95	3.95
10th Frame	9.95	3.95
5 Computer Hits	—	3.95
Nemesis Warlock	4.95	
Thing Bounces Back	9.95	3.95
Shoolins Road	8.95	3.95
Grange Hill	9.95	2.99
Top Gun	8.95	4.95
Shockway Rider	8.95	4.95
Thanatos	9.95	2.99
Deep Strike	9.95	2.99
Sigma 7	7.95	2.99
Battle Of	—	
The Planets	7.95	1.99
Academy	8.95	4.95
Football Manager	9.95	2.99
Gyroscope	9.95	2.99
Fighting Warrior	9.95	2.99
Winter Games	9.95	5.95
Nomad	8.95	2.99
World Class	9.95	6.95
Leaderboard	9.95	2.99
Fairlight	9.95	6.95
World Games	9.95	6.95
International Karate	9.95	3.95
Tempest	9.95	2.99

Atari ST

	RRP	OUR
Rode Runner	24.95	18.95
Prohibition	24.95	18.95
World Class Leaderboard	24.95	18.95
Barbarian	24.95	18.95
Arkanoïd	14.95	10.50
Auto Duel	19.95	14.95

Amiga

	RRP	OUR
Barbarians	24.95	18.95
Space Battle	7.50	
Phalans	7.50	
Demolition	7.50	

ORDER NOW!

RENEGADE

Spec C64 Amstrad

5.25 6.25 6.25

OUT SOON!

WE WON'T BE BEATEN ON PRICE!

Any game not released will be sent on day of release.

Free P&P on all orders over £5. Under £5 please add 50p. Overseas please add £1 per game. Callers welcome at our shops.

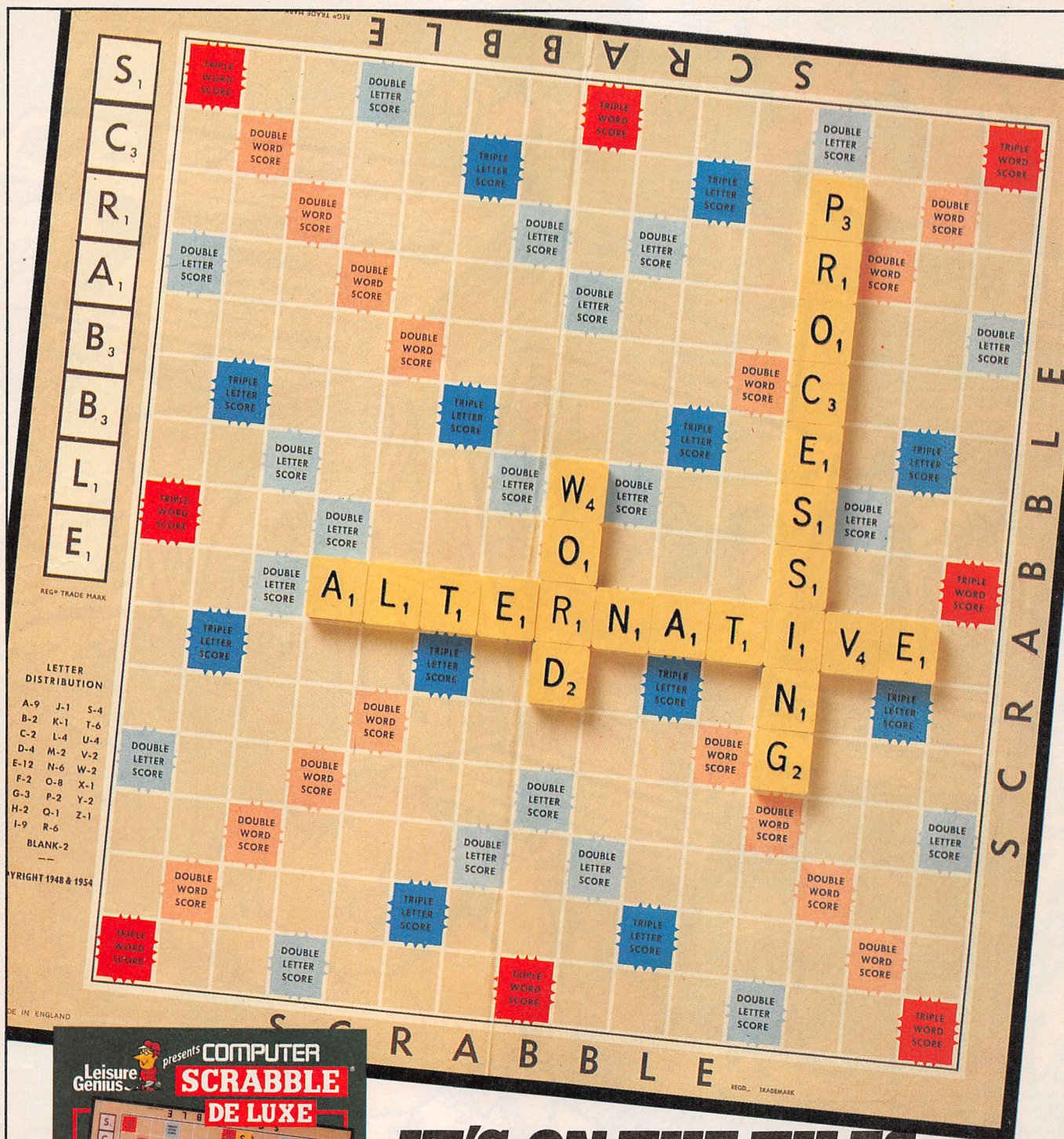
Games not listed? Phone our Hotline Now!

Please note our mail order division will soon be moving to offices above our new shop in Burslem in Stoke-on-Trent, we therefore need to clear much of our stock before we move. Phone for a Bargain Now! Our shop at Newcastle will still be open 6 days a week.

FINALLY

Thanks to all our Customers for enabling us to offer such good prices and a good service. STICK WITH US, YOU'LL BE GLAD YOU DID. Catalogues available soon!

PHONE OUR HOTLINE NOW 0782 619159



IT'S ON THE TILES.

Leisure Genius presents this classic word game elegantly translated to computer. SCRABBLE® is available for most home computers and now a new De-luxe version is available for Commodore 64/128, Spectrum 128 and Amstrad CPC 6128.

Computer SCRABBLE® faithfully follows the board game rules and has a large vocabulary. The computer provides you with intelligent computer 'opponents', a clock and 8 skill levels.

Commodore 64/128 cass ☐ £12.95
disc ☐ £15.95

Spectrum 128 cass ☐ £10.95
disc ☐ £15.95

Amstrad CPC 6128
disc only ☐ £15.95

Name _____
Address _____



Please make cheques or postal orders payable to Virgin Games Ltd and send to 2/4 Vernon Yard, Portobello Road, London W11 2DX. (Please do not post cash)

SCRABBLE® Trade Mark and Copyright licensed by J.W. Spear & Sons PLC. Leisure Genius® is a registered trademark of Winchester Holdings Ltd, a wholly owned subsidiary of Virgin Games Ltd.



MORE FUN THAN A BARREL FULL OF MONKEYS

JACK IN COCONUT CAPERS

THE NIPPER... II

Help! Stop! The country has had enough, no more can it take of the devilish pranks and obnoxious behaviour of darling little Jack. Off to a land where many of your kind were banished long before. Off to Australia Jack you must go!!!

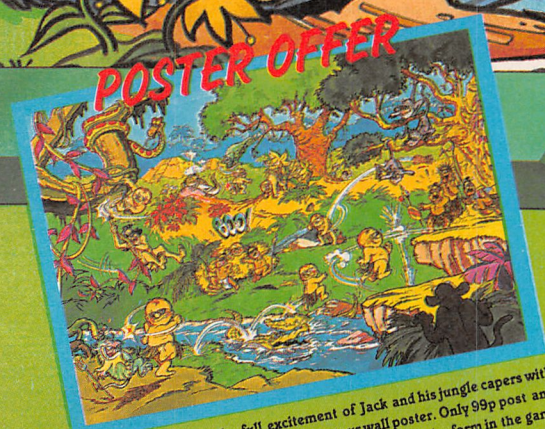


Its no fun being cooped up. Maybe there's something down there that fancies being mugged ... bitten ... spat at or pinched. As ever poor Mam and Dad dutifully follow their nauseating little offspring.

On the ground, in the air, you can't keep a mischief maker out of trouble and with all those pretty air hostesses around ... well what do you expect.



Gremlin Graphics Software Ltd.,
Alpha House, 10 Carver Street, Sheffield S1 4FS
Tel: (0742) 753423



Capture the full excitement of Jack and his jungle capers with this super full colour wall poster. Only 99p post and packing included. Order form in the game.



CBM 64/128

Cassette £9.99 Disk £14.99



SPECTRUM 48/128K

Cassette £7.99



AMSTRAD

Cassette £9.99 Disk £14.99

BMF steps in on piracy

THE BMF last week announced that it is to mount a major campaign against software piracy, something which is estimated to cost the UK computer industry around £150 million every year.

Welcoming action taken by FAST (the Federation Against Software Theft), and the arrival of new legislation to combat the problem, BMF spokesman Clive Booth warned:

"Legislation and litigation can only address the worst

abusers. We need a parallel effort to educate both business and the public at large about the issues.

"People need to understand that buying software is effectively buying a licence to use information, and not a 'buy and do as you please' commodity," he added.

"It's a little like a road fund licence. There are rules and guidelines to be observed wherever you go and it should be the same with software."

Addictive fixes it for a new Nixon

ADDICTIVE Games, a part of the Prism Leisure Corporation PLC, has recently re-launched *President*, a game designed to test your ability to rule effectively the nation.

Priced at £2.99 this time around, the game gives you the chance to become the next Roosevelt or Nixon (although the game seems not to incorporate such unplanned disasters as Chappaquiddick and Watergate).

Programmed by Kevin Toms, the man responsible for the original strategy success, *Foot-*

ball Manager; *President* includes such day to day traumas as oil wars, balance of payments difficulties, and electoral popularity.

President will be re-released on September 23rd, and will be available for the Amstrad CPC range of computers, as well as the Spectrum and Commodore 64.

Softek's budget label at Show

FOLLOWING the launch of its ACE arcade label, leading software house Softek International has also announced its plans to enter the budget market with a second new label.

The *Micro Selection* range will be launched at this week's PCW show, and the initial batch of releases will include re-packaged hits such as *Thai boxing*, and *Sky Runner*. Future releases will be a mixture of both original titles and further re-releases, though there are no definite plans to repackage any old Softek or Edge titles as yet.

The new label will be priced at £1.99, but there is also likely to be budget material available for the ST and Amiga later this year, probably to be aimed at below the £10 mark.

A Softek spokesperson told *Popular*:

"This isn't second-hand material. We're very excited about launching the two new labels, and we know that this is going to be a sure-fire hit for Christmas."

Equinox may see the light of day

TYNESOFT, the rapidly expanding games software house, has purchased Mikro Gen from the CSD receiver.

This is an odd turn of fate for Mikro Gen who were sold. Colin Courtney, Managing Director of Tynesoft, said that most of the existing titles would be released in Tynesoft's Microvalue range, but that some of the as yet unreleased software (such as the long awaited ST version of *Equinox*) would be released at full price later in the year.

The purchase concludes a good week, and indeed year, for Tynesoft which published accounts showing turnover up to over £1,000,000 and profits up 200%.

The dispute over the Sparklers titles which Maynard International recently bought from CSD has been settled.

A total of 120 Sparklers items will now appear either under the Sparklers imprint itself, otherwise on Alternative or Top Ten.

Glentop brought to book with GFA title

GLENTOP Press Ltd, publishers of *GFA Basic*, has announced details of a forthcoming book on the language. The book, written by *GFA Basic*'s author, Frank Ostrowski, will cover programming all aspects of GEM, graphics, and other applications. It is due for release in mid-October and will be over 280 pages and be bundled with a disc containing numerous example programs.

The much delayed 3-D graphics package for the Atari ST,

GFA vector, will now be released at the PCW show, part of the delay being due to poor duplication of the German translated manual.

The program, which integrates fully with *GFA Basic*, features up to 1024 points, 1024 lines, 32 objects. It also sports rotation in one degree steps upwards, about X, Y and Z axes and scaling factors from 1,64th to 8 times.

Contact Glentop Press on 01-441 4130.

DIARY DATES

SEPTEMBER

23-27 September
Personal Computer World Show

Olympia, London

Details: Latest hardware, software and peripherals for business and leisure computing

Price: £3, £2 - (parties over 10)

Organiser: Montbuild

01-486 1951

OCTOBER

15-17 October
Desktop Publishing Show

Business Design Centre, London

Details: Demonstrations of latest hardware and peripherals, plus seminars and user clinics

Organiser: Database

Exhibitions, 061-456 8383

NOVEMBER

14 November
National Einstein Exhibition

National Motorcycle Museum, Birmingham

Details: Einstein software etc.

Price: 50p

Organiser: UKEUG (0473) 49507

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. We cannot accept responsibility for any alterations to show arrangements.

Wonderful, wonderful life

As a regular reader of PCW I never cease to be amazed at Kenn Garroch's ability to answer the many diverse problems as posed in his PEEK & POKE column. How can one person know so much about so many different computers, be it a technical or programming problem, and then again have time to compose the sometimes quite involved programs required as answers. He certainly receives my admiration and I'm sure that of your other readers. It's good to know that there's someone to fall back on during these times of computer advancement.

*John McCleave
Dorset*

Cruel world

As a serious computer user I feel compelled to write regarding the advert that Commodore has been running about the Amiga A500.

I feel that it's rather cruel of Commodore to categorise other home and business computers as fit for the toy cupboard.

In fact I doubt if many serious programmers and business users would ever need to use a computer with a blitter chip, four channel stereo sound and brilliant colour graphics - unless of course they are games programmers.

Judging by the large percentage of games-oriented software on the Amiga, I fail to see why Commodore cannot claim its A500 to be no more than a toy as well. After all a toy is a machine whose major function in life is to play games.

And of course if the computer's sound, colour graphics and screen handling is better than the other computers', then you have - a super toy.

Can you see an accountant using a complex spreadsheet needing all that?

As for the speed of the Amiga A500 I suppose it is relatively fast (with its 16-bit databus and a cpu speed of 7.14MHz when compared to, say, the PC or other 8-bit machines).

But when it is compared to the Atari 520STFM (also with a 16-bit databus and a cpu speed of 8MHz) or the 640k Sinclair QL (which only has an 8-bit databus and a cpu speed of 7.5MHz) the A500 is somewhat

slow. Although the A500 is faster when dealing with the screen and sound because of its dedicated chips in this area.

Don't get me wrong. I am not writing this letter to bring the wrath of Commodore and the Amiga users upon me.

I just think it's sad when a reputable firm like Commodore which has been in the computer industry for a number of years should act below the belt and go computer bashing. Isn't there enough computer-bashing going on among rival computer users without the need for the big companies joining in?

Finally, on a lighter note, I think that the Amiga A500 is a wonderful machine (if you can afford it!) and I shall be saving up my pennies for one.

*A terminal junkie somewhere
in the British Isles.*

We look forward to other reader's comments on this. Your comment regarding business users not needing the Amiga's graphics capabilities has also been made by senior industry observers.

But surely Commodore is free to pitch its advertising as it sees fit?

A not quite right knight

With reference to PCW issue 11/9/87. On pages 10 and 11 you carry an interview with Sir Clive Sinclair in which reference is made to the Acorn Archimedes, having long been an admirer of Sir Clive I am sorry to see him making such remarks that bring back memories of the original BBC contract comments from Sir Clive. I am sad to say that he has got his facts wrong, or if he hasn't then the programs used to test the speed were very badly written.

Sir Clive states that multiplying two numbers takes 23 micro seconds on the Archimedes. Apart from being a sweeping statement without any explanation or qualification it is wrong.

There is no indication of the size of the numbers to be multiplied so I will give details of two separate cases. To multiply two numbers together to produce a 32 bit result will have a worst case time of 2.125 micro seconds. This is made up of 1 's' cycle and 16 'i' cycles. An 's' cycle takes 125 nano-seconds in RAM and 250 nano-seconds in ROM. All 'i' cycles take 125

nano-seconds. A multiply by 0 or 1 takes 125 nano-seconds.

If you require double precision with a 64 bit result then using a sensible routine results in a worst case time of 5 micro seconds. Certainly a lot faster than Sir Clive claims. The way in which code is written is crucial on a RISC processor and where sloppy programming might not make much difference on an 80386 it certainly does on the ARM. For instance if you include branches everywhere the code will be a lot slower. It is often much better to repeat small sections of code than to call them as a sub routine.

I am confident that the Archimedes will be a world beater just as long as we British don't kill it ourselves first.

*Dave Clare
director
Clare's Micro Supplies*

Eprom, and on . . .

Iwould like to suggest or request that PCW publishes an article covering the subject of EPROMs and burners.

The situation is that so many devices now contain EPROMs or ROMs, in many cases programmed with annoying characteristics that many an owner would dearly love to amend! I refer to everything from video recorders ("time-out" and revert to channel 1 after 2 minutes!); car alarms (delay periods) and others.

Nearer to your heart, of course, are computer ROMs with well-known bugs which the owner knows how to correct, and would like to do so. Or stretches of unused ROM locations where the owner would like to add some facilities. Second hand 8-bit computers can be picked up cheaply enough for many of your readers to want to experiment, if only they had the facilities or knowledge to burn an EPROM!

If a chip could be taken out of some gadget and paged at a known part of a computer's memory map, and assuming that the type of Processor in the gadget could be seen (frequently Z80s are used), then most of your readers would not have too much difficulty in disassembly. (Even if their computer uses a different processor, it isn't too hard to write a disassembler in BASIC).

It would be very helpful if you

could publish something covering the following points for the usual 8 and 16-bit home micros:

- 1) How is the memory map made up, in terms of pin connections? In other words, how can you tell which memory chips on a board appear where in the map?
- 2) What are the pins on RAM chips and EPROMs?
- 3) Is there an EPROM burner available for each of the common home micros? If so, perhaps you could list suppliers?
- 4) Is it generally possible to replace ROMs with EPROMs? Are response times as good?
- 5) In general terms, what would the hardware need to be, to attach to a computer's user port for the purpose of reading in or paging in the contents of an external memory chip? I am thinking it would be good to know how to make up a "black box", perhaps with a push-button on it.

I feel that a sizeable proportion of your readership know enough and have enough programming ability to want to do this kind of thing, but would like to know more hardware, which is always the stumbling-block.

*Peter Erskine
Essex*

Phew, we'll see what he can do to help!

No money for non players

Iwas fascinated to read that Commodore can afford to shell out one and a quarter million quid for Chelsea football club, but they still can't afford to bring the price of the Amiga down to a level where it is truly competitive with the ST.

Most of the people I know who use/buy home computers' nearest contact with the sport is through playing the venerable 'Football Manager'! Even the ones that do watch football would have much rather had the money off their CBM computers . . .

*Alan Lenton
London*

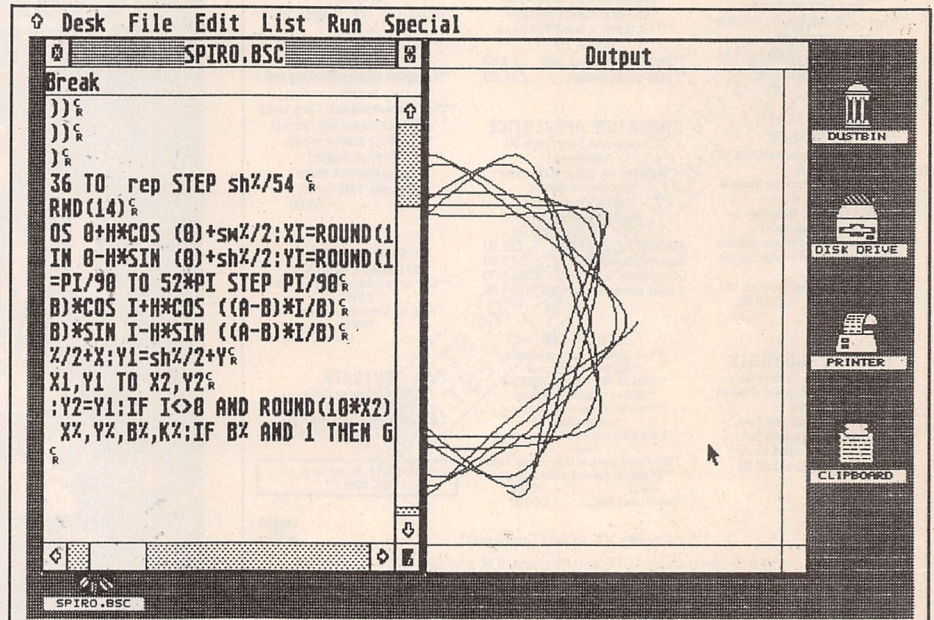
PS: I wonder if any of your readers who took up the Amiga voucher offer noticed a certain lack of enthusiasm on the part of the dealer they bought from . . . this may be to do with the fact that CBM is making the dealers pay £55 out of every £100 they give off - still they have to raise £1.25m from somewhere!

STacks of Basic

Disc-based Basic makes the Atari ST a natural for third-party variations, but not all versions are equally useful, and Atari's own update is the worst of all, as Duncan Evans finds on the test bench.

Unlike most eight bit micros, the Atari ST has two features which encourage third party implementations of Basics. The first is that the language is not built in, but supplied on disc. The result is that *Atari Basic* is unbelievably awful.

So which Basic do you go for? Stick with the supplied *Atari Basic*, or go for Glentop's *GFA Basic*, Computer Concept's *Fast Basic* or indulge in HiSoft's *Basic Compiler*? In this article we set out the relative merits and drawbacks of each product, and deal with them chronologically.



Fast Basic: excellent support for Gem, but sloppy cursor control

Table 1

PCW test	Atari	Fast	GFA	HiSoft
1	0.9	0.145	0.105	0.048
2	2.8	0.58	0.395	0.056
3	5.94	1.305	1.025	0.198
4	8.03	1.55	1.01	0.258
5	8.03	1.505	1.085	0.263
6	14.2	2.575	1.765	0.536
7	20.9	4.11	2.845	1.026
8	10.0	2.725	2.945	1.411
Avg:	8.85	1.801	1.397	0.475
Circle (r75)		0.34	0.055	0.075
Solid Circle		0.34	0.17	0.21
Box		0.09	0.0175	n/a
(130sq)				
Solid Box		0.09	0.0475	0.075

Table 2

Product	Atari	Fast	GFA	HiSoft
Price (disk)	Free	45.95	45.95	79.95
Editor	4	9	7	6
Features				
Ease of Use	1	6	9	7
Graphics	5	8	8	7
Sound	7	3	7	7
GEM	1	8	7	7
File Handling	6	8	7	7
Structure	4	7	8	9
Overall	2	8	9	7

Atari Basic

Atari Basic sports the most unhelpful and unusable editor that I for one have ever encountered. Half the time it doesn't do what it's supposed to.

One of the more annoying features is that there is no wraparound on the windows so that when a line reaches the right hand edge the whole program lurches left, and you lose track of what was on that side of the screen.

The entire thing is unbearable to program with, considering the alternatives.

As far as commands go, *Atari Basic* just about measures up to the good 8-bit implementations, but is sadly lacking in a number of vital areas. Graphics are only adequately catered for, although there are no sprite commands, with *CIRCLE* and *ELLIPSE*, and filled versions thereof. *LINEF* and a *FILL* that allows use of all the ST's inbuilt styles. On the subject of colour there is the ridiculous situation of having 512 colours, and not having a command to change the 16 colour palettes you start with (in low resolution).

File handling is dealt with much better as you can load and save not only Basic programs but blocks of memory with *BSAVE* and *BLOAD*. For dealing with records and data files there are *OPEN*, *PRINT#*, *CLOSE*, *GET#*, *INPUT#*, *LINE INPUT#* and *WRITE#* to juggle with.

Possibly the only area of *Atari Basic* that can hold its own is the sound department.

The *SOUND* command lets you control three music and a white noise channel with volume, notes played, octave, and duration parameters. *WAVE*, controls the waveforms used in *SOUND*, via envelope, shape, period and delay parameters. Better than the facilities offered by *Fast Basic* and just about comparable with everyone else's.

As far as structure goes you can have *GOSUBs* and *GOTOs* aplenty. There aren't any procedures, *REPEAT...UNTIL*, or *DO...LOOP* constructs although *WHILE...WEND* and *IF...THEN...ELSE* are supported. Pretty poor fare indeed.

The next black mark against this language is in the provision of *GEM* commands. There aren't any. Want to read the mouse, use pull down menus, alert boxes? Tough. The only option is write your own routines which poke values into *CONTRL*, *INTIN* and *PTSIN* arrays, and then call the required operating system routine with *VDISYS* for the *VDI*, or use *GEMSYS* and its arrays for the *AES*.

So, having determined that only the poor and the mad program in *Atari Basic* it might have come as some relief to those thinking of purchasing an ST that Metacomco *MCC Basic* will be bundled with the machine in the new year. Unfortunately *MCC Basic* can only be viewed as the finished version of what Atari is currently bundling. Most of the bugs are fixed and here are more commands, especially in the graphics department, which includes the desperately need-

continued on page 15 ►

The AMIGA Centre Scotland

SPECIAL OFFERS

Alien Fires.....	£35.00	Deluxe PAINT II.....	£66.00
Deluxe VIDEO 1-2.....	£112.00	Deluxe-Paint.....	£52.00
DIGI-VIEW (including A500/A2000 adaptor).....	£185.00		

AIRT

- **State of the art icon-driven programming language
- **Over sixty commands
- **Over 5600 instructions possible per program
- **Includes Editor, Compiler, Print Utility, Form Utility.....

DOUG'S MATH AQUARIUM

- **Explore and display functions in 2D/3D
- **Uses recursion to create fractals, Mandelbrot
- **Wire Frame, Contour Map or Superimpose modes
- **ZOOM in/out and change position
- **Cycle colours and change Sample Rate
- **Teaching/Learning/Research tool.....

EARTHBOND FONTS

- **Over 90 fonts on three discs
- **Over 80 different point sizes on each disc
- **Utilities to view any Font
- **Upgrade Fonts-using discs.....

AMAZING COMPUTING

- **The best monthly AMIGA magazine available
- **Shipped directly to us by air
- **All back-issues available
- **This month's Issue Number is Volume 2.8
- **Sent by First-Class post.....
- **Year's subscription.....

ANIMATOR: APPRENTICE

- **Create solid Disney-style 3D Animations
- **Includes shading in 4096 colours
- **Background matting
- **Realtime audition (Requires 1Mb to run)

- ANIMATOR: JUNIOR.....
- Demonstration Disc.....
- Library Discs.....
- 2-hour demo film on VHS.....

SCULPT-3D

- **Eric Graham's new masterpiece
- **3D Modelling Program
- **THIS IS THE UK PAL VERSION
- **Mouse or keyboard-driven
- **Combine primitive solids to form complex shapes
- **Build shapes by extruding or spinning curves
- **Construct surfaces from contour lines
- **IFF output: previews in less than one minute.....
- Demonstration disc.....

FORMS IN FLIGHT

- **2D/3D Drawing and Animation
- **View from any perspective or direction
- **Rotate, Pan, Roll, Magnify, Move In/Out
- **Splines, Polygons, Freehand, Snap
- **Complex Object-Nesting and motion
- **Surface extrusions - any angle
- **Efficient hidden line removal
- **Red/Blue stereo images
- **Plotter support
- **Comprehensive manual (Requires 1Mb to run).....

RAY TRACER

- **3D Graphics in 4096 colours
- **Disc contains Source Code in C and BASIC
- **Enter our Competition and win a 3D Utility.....

BUTCHER

- **25 IFF Graphics Utilities
- **Full review in YOUR COMMODORE September 1987

*** Send SAE for full list of over 200 titles ***

*** 24 hours VISA Card Service ***

*** All prices include VAT and Postage (UK and BFPO) ***

*** Callers: Tuesday-Saturday 10.00am to 6.00pm ***

AMIGA Centre Scotland

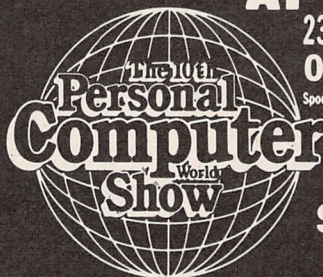
4 Hart Street Lane, Edinburgh EH1 3RN Tel: 031-557 4242 anytime

SEE DRIVER

AT

23-27 SEPTEMBER 1987
OLYMPIA LONDON

Sponsored by Personal Computer World and PC Week



**PCW
SHOW
STAND No.
3052**

FEATURING

FREESCAPE™

**FORGET WIRE-FRAME 3D.
FREESCAPE IS SOLID!**

**incentive
SOFTWARE LTD**

2 MINERVA HOUSE, CALLEVA PARK, ALDERMASTON,
BERKSHIRE RG7 4QW (07356) 77288

You've probably heard about us!

Universities: Schools: Colleges: Government Departments: Businesses
and

Hundreds of customers supplied and supported throughout the UK & Europe

ST User Groups

we will be delighted
to offer you special
deals.

ST Deals

Please call for our latest prices.
Special Value packs always on offer.

3.5" Disks

bulk pack box of
ten single sided disks
Only
£15.00 + £1 P&P
All including VAT.

Part Exchange

Mail Order

Finance

or

Visit our showroom 600 square feet devoted to the Atari ST

BATH COMPUTER SHACK

8E CHELSEA ROAD, LOWER WESTON, BATH, AVON
TELEPHONE: 0225 310300

TROWBRIDGE COMPUTER SHACK

CASTLE STREET, TROWBRIDGE, WILTS
TELEPHONE: 02214 67299

◀ continued from page 13

ed mouse and RGB ones. Low level access to the BIOS and XBIOS has been improved but alas, alas, the silly people have left the editor exactly as it was! The stupidity of this leaves me speechless.

Fast Basic

Having observed how cumbersome the *Atari Basic* editor was, Computer concepts, veterans of the BBC market, sought to produce one that rectified the faults and provided a complex and comprehensive programming environment.

Well, the editor is nothing if not packed with useful features. GEM is supported both from the point of desk top accessories and easy mouse interpretation, alert boxes, windows, drop down menus, and shrinking and expanding boxes.

Up to ten programs can be held in memory at one time, and control is easily switched between them. In the early stages of programming development this is certainly handy as you can store your main program in one segment and then test subroutines in the others.

Word processing like options are available to cut and paste sections of programs, and in the same vein you can search and replace items. Having cut a block you can even paste it into a different programming segment, so the testing subroutines concept mentioned earlier is made even easier.

If it all sounds like a bed of roses then beware, because there are a couple of weeds in this particular garden. Compared with the *Atari Basic* window system, *Fast Basic's* edit window, output window and, usually concealed, immediate windows are a definite improvement. But not so that programming becomes as easy as using the *GFA Basic* editor.

Once again there's no wraparound on the window and the manner in which text disappearing off one end is handled leaves much to be desired. It's better than *Atari Basic* but then that's not saying an awful lot. The other point is that cursor control is very sloppy, long after you take your finger off the cursor or delete keys the cursor continues to romp along.

As far as commands go, *Fast Basic* scores heavily. All the GEM graphics primitives are available as direct commands. From patterned lines to solid boxes with rounded edges, ellipses, circles, solid or empty. One of my favourites is the *XTSCROLL* command which scrolls the contents of the text window. You specify the destination location and off the thing flies, superbly smooth, exquisitely fast. Text handling is undoubtedly best catered for by *Fast Basic*.

Structured programming is quite well served with IF...THEN...ELSE...ENDIF, DEF PROC and PROC, WHILE...WEND, and REPEAT...UNTIL. Strangely absent though is a DO...LOOP and EXIT LOOP construct. *Fast Basic* supports the usual BLOAD and BSAVE and supplies a compre-

hensive selection of file handling commands. Based on the BBC commands of old, OPENIN and OPENOUT deal with opening files for read/write operations. Also OPENUP, BGET#, BPUT#, PTR#, GETREC#, PURREC#, PRINT# and EXT#, which returns the length of a file, add to a collection which provides every means of file handling that your heart desires.

As mentioned earlier, GEM is very well supported. For the simpler functions like reading the mouse and dialogue boxes, programming is straightforward and easy. For some of the more complex GEM functions the manual abandons all hope of teaching the unconverted and recom-

that you can edit in 80 columns and still use the 16 colour mode! Only HiSoft's *Basic Compiler* has anything like a similar feature.

At the top of the edit screen is a black bar containing all the cut, paste, block move, and search and replace functions. You can either point at them with the mouse or press the relevant Function Key.

What is odd looking about *GFA* programs is that concatenation is not allowed. This, combined with automatic indenting gives listings a very structured look. Once again there is no wraparound (there isn't on any of these products) but *GFA* handles lines that are greater than the screen length a good deal more intelligently. For one thing with

Save	Save, A	Quit	New	Blk Sta	Replace	Pg up	Text 16	Direct	Run
Load	Merge	Llist	Block	Blk End	Find	Pg down	Insert	Flip	Test

```

ACls
Clear
Print
Print "*****"
Print "  **  ATARI ST: BASIC CONVERTER  **"
Print "  **  ST BASIC to GfA-BASIC  **"
Print "*****"
Print
Print "Atari - GfA-Basic / (c) 1986 by GfA Systemtechnik"
Print "Written by Klaus Keller, Herdecke"
Print "Program Version 3.0 / 10.10.1986"
Print String$(55,95)
Print "The following program is still under development"
For T=1 To 15000
Next T
Cls
Print "FUNCTIONS OF THE PROGRAM:"
Print "PART A:"
Print "(1) Insert missing GOTO's after THEN or ELSE"
Print "(2) Replace line numbers being branched to with markers"
Print "(3) Complete the procedure for program branches"
Print "(4) Replace all GOTOXY with PRINT At"
Print "(5) List from a beginning mark to an ending mark"

```

GFA Basic: incredibly fast, and very easy to edit – even in colour

mends you get a book on the subject instead.

GFA Basic

After sweeping across Europe and making large inroads into the American market SystemTechnik's *GFA Basic* reached the UK shores, to be duly marketed by Glentop.

GFA Basic's main claim to fame, if you believe all you hear, is that it is marginally faster than *Fast Basic*. In fact the programs run at an incredible speed, and the difference between it and *Fast Basic* becomes very noticeable when using graphics.

All this is highly laudable – but what makes me favour *GFA* rather than *Fast* is the editor. It undoubtedly has less features, and you can't have program segments, but what more than makes up for this is that the editor supports two screens. The edit screen and the display, which you also type commands in directly from. Switching between the two is easy, and there are no annoying windows to get in the way (unless your program uses them of course).

The edit screen works, if you are in low or medium resolution, in medium res mode so

only one command statement per line you're unlikely to run off the end of the screen. But, if you do, then only the line that you are entering scrolls off to the left. And it only does one character at a time, as you type them in at the other end of the line.

GFA Basic supports virtually the same graphics commands as *Fast Basic*, fills, boxes, circles, ellipses, arcs, polygons, various text styles and also a number of blitting options. GET and PUT read a specified section of memory into a string and then splat it back down on the screen again. *Fast Basic* and HiSoft *Basic* also contain these commands but the *Fast Basic* ones are not as impressive in terms of speed, and the *HiSoft* ones are very clumsy to use. As an example, if you cut a square, eight pixels by eight, you can splat it at the rate of 230 per second! Even larger areas are still gloriously fast. For whole screens though, there are a couple of dedicated commands, not seen on the other Basics, namely SGET and SPUT which simply read an entire screen into a string and then transfer it back again.

The audio department is covered as well
continued on page 17 ►

HiSoft Software. What can you say?

Come to the PCW Show and see the software that everyone's talking about ... we're on Stand 3077

Saved! by HiSoft
Customer and Press comments

Could never be without Saved! A useful piece of software! Very useful, will be used endlessly. Invaluable! Excellent! Superb! Very useful and well presented. **Our customers.**

Saved! looks like a comfortable winner in all departments. **ST Update 7/87.**
This has got to be good value for money by anyone's way of thinking. **Atari ST User 7/87.**
Using a rating scale of 0 to 10 we'd give Saved! 15. **ST Applications 6/87.**

FTL Modula-2 is a fast, integrated and complete Modula-2 development system supplied with full library sources. Use the language of the future on your Atari ST.

FTL MODULA-2

DevpacST
Customer and Press comments

A very professional and excellent piece of software. Nice documentation. Very powerful, excellent manual. A programmer's best friend. Superb! **Our customers.**

this package is strongly recommended. **Atari ST User 7/87.**
DevpacST is well-designed, well-implemented, HiSoft should be congratulated for a job well done. **Byte 11/86.**
DevpacST is the assembler analog of Turbo Pascal ... it is by far the easiest and fastest assembler package to use. **CL 10/86.**

HiSoft BASIC Compiler
Customer and Press comments

Excellent, professional product. Worth waiting for! Makes BASIC into a high level language. Great!! **Our customers.**

To sum up: HiSoft BASIC is extremely fast, powerful and compatible ... In addition its friendly environment makes it a joy to use. **Atari ST User. 9/87.**
If outright speed is the most important factor, the HiSoft compiler wins hands down ... HiSoft's compiler is the only BASIC system on test which is truly extendable ... HiSoft BASIC is a true development tool ... the product with by far the greatest potential. **ST World. 8/87.**

Order by Access/Visa or send in a cheque:

HiSoft BASIC	£79.95
DevpacST	£49.95
Saved!	£29.95
FTL Modula-2	£69.95

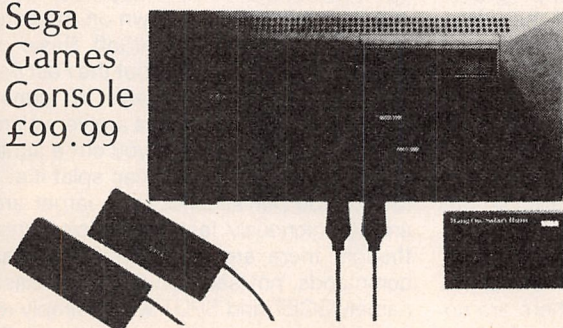
ORDER

HiSoft
High Quality Software

The Old School, Greenfield, Bedford. MK45 5DE Tel: (0525) 718181

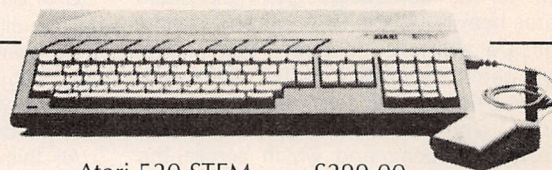
The Best Software Shop in Town

Sega Games Console
£99.99



Available NOW!

Atari 520 STFM £299.00



Atari 520 STFM	£299.00
5 Disks Crammed with Software	+
Mouse Mat	FREE
Barbarian	FREE

ULTIMA

WHITE LION WALK GUILDFORD SURREY
TELEPHONE 0483-506939

31 HANOVER BUILDINGS SOUTHAMPTON
TELEPHONE 0703-39419
OPPOSITE MACDONALDS

◀ continued from page 15

as *Atari Basic* and *HiSoft*, and thus better than *Fast Basic*, with BEEP, SOUND and WAVE.

File handling is pretty good, although it falls short of the excesses offered by *Fast Basic*. What is done better are the poke and peek commands. *GFA Basic* uses POKE, DPOKE, and LPOKE for single, double and four byte operations, while *Fast* uses indirection operators such as ? and ! which can hardly be said to be as friendly. If you prefix the *GFA* commands with an S you can poke in the supervisory mode of the 68000, ie, reserved storage space where you are normally not allowed.

When it comes to structure, *GFA Basic* is a little odd in that its procedures are labelled PROC name(var) but are accessed with GOSUB name(var) and recalled with RETURN. Make no mistake though, quaint though they may sound, these are procedures and you can pass variables and have local variables as well.

The other commands in this group are IF... THEN... ELSE... ENDIF, DO... LOOP, REPEAT... UNTIL and WHILE... WEND. A good selection, only bettered by *HiSoft Basic*'s similar, but more flexible, structures.

As I've mentioned *GFA Basic* is very fast but there are instructions built in to make programs run even faster. INC and DEC increment and decrement a named variable by one, and make counting even faster.

Access to GEM is something of an oddity. On the one hand you have wonderfully simple mouse and dialogue box commands, and on the other, there's the rather complex, and poorly explained, menu commands. Conversely, one area where *GFA Basic* completely outstrips *Fast* is in providing low level access to things like the BIOS and XBIOS.

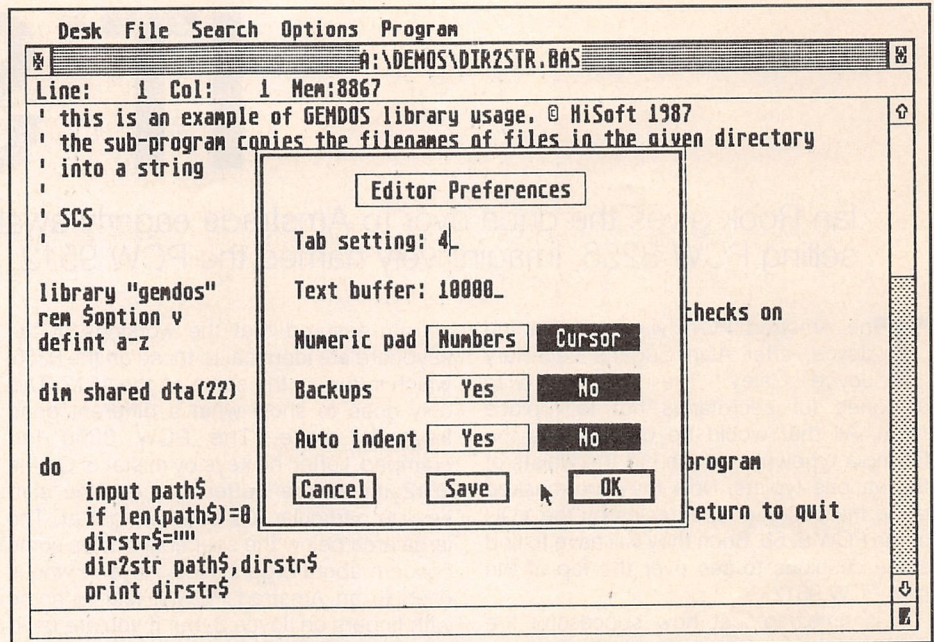
GFA Basic is good, very good in fact. But wait, the German programmers are working on version three of the program which will be a major revision. Amongst the plans at this stage are those to add another 150-200 commands to the interpreter. And, almost unbelievably, they expect the thing to run up to twice as quickly!

HiSoft Basic Compiler

The latest Basic into the fray is the *HiSoft Basic* compiler which is obviously not an interpreter, like the others, but a text editor and a compiler. Programs are thus written using the editor and then compiled either to memory or to disc.

One of the major selling points about *HiSoft Basic* is that it will compile standard *Atari Basic* programs without change, although of this I'm somewhat suspicious. The advantages provided by this product are the compatibility mentioned, a usable programming environment, and an extended command list. Oh, yes, your programs will naturally run much, much faster as well.

The first thing you can't help but notice is that the text editor only runs in medium or high resolution modes. So, for applications



HiSoft Basic: a bit of an oddity, but a useful adjunct to Atari Basic

that run in low resolution you'll have to use the SCREEN 0 command at the start and SCREEN 1 at the end.

The editor itself is very spartan looking, and its features reflect that. Lines can be deleted or inserted and blocks of lines shuffled around and deleted. The commands are all available from the keyboard and are similar to those used in *Wordstar*. It's all very simple to use but doesn't match *GFA Basic*'s, or the complexities of *Fast Basic* either.

The graphics commands are just the same as *Atari Basic*'s with one or two important additions. POINT reads the colour of a specified pixel, and SCREEN is used for selecting the screen mode although you should note that only TOS or TTP programs should use this command as the GEM AES and VDI don't like screen mode changes from within a program. Not many additions there, I'm sure you'll agree. There are however more. A lot of functions and commands are available on the disc as machine code routines, contained within libraries. You must use the LIBRARY command and the library name (ie LIBRARY XBIOS) to access those particular functions, which are then loaded off the disk and incorporated into your compiled program. While this is a good idea in theory, it should after all mean that your programs are compiled more efficiently, in practice it results in quite a messy situation.

The actual libraries are the BIOS (Basic Input/Output), XBIOS (Extended BIOS), GEMDOS (the operating system), GEMVDI (Virtual Device Interface) and the GEMAES (Application Environment Services). More than any other version of Basic, HiSoft gives you access to these routines within the ST. While the manual explains many of these functions well or adequately, some of the explanations are unclear to say the least. There's lots of good stuff here but expect hard work getting at it.

Having seen that Atari Basic supported few commands for structured programs, HiSoft have certainly made an effort in this department with procedures, DO... LOOP, REPEAT... END REPEAT, and WHILE... WEND. What gives HiSoft Basic the thumbs up over the others here is that the DO... LOOP construct can have WHILE and UNTIL added to the DO, and WEND, WHILE and UNTIL at the bottom end. Undeniably flexible.

Probably Atari Basic's second biggest failing is that there are no commands to control the GEM interface. HiSoft have made improvements in this direction as well with MOUSAE, and a plethora of window commands. Other support can be found in the libraries of course.

Conclusions

Both *GFA Basic* and *Fast Basic* are very good implementations of the language. If you have half a mind to develop 68000 machine code programs as well, then your best bet is *Fast Basic* as it contains an inbuilt assembler. The *Fast Basic* manual is generally better than that supplied with *GFA Basic* (which was translated from German after all) but despite these two points I would heartily recommend *GFA Basic* instead, and it should be noted that there is a rather good compiler for the languages as well.

HiSoft Basic is an oddity. I wouldn't recommend it over either of the two major Basics because I don't particularly like the way it works. I would say it is worthwhile for anyone who is a committed *Atari Basic* programmer to purchase *HiSoft Basic* because of the speed increase and more friendly environment.

As far as the new version of *Atari Basic* is concerned, I'm afraid we can write that off already.

Duncan Evans

IT'S THE

Ian Rook gives the once over to Amstrads eagerly awaited successor to the best selling PCW 8256, imaginatively named the PCW 9512.

The Amstrad PCW was code-named Joyce, after Alan Sugar's secretary Joyce Caley. The machine was designed for secretaries not to replace them. All that would be ousted was the Olympia typewriter which hid the waists of the nations typists. Now they are masked up to the designer spectacles by the VDU of the PCW 8256. Soon they will have to find some cushions to see over the top of the new PCW 9512.

It is amazing just how successful the PCW has been. The reception desk of my local Amiga software house is graced with a PCW; many of the major magazines and newspapers have their text crafted on Amstrads. Even *Popular* relies on a crowd of Joyces to put the words on your page. You'd think that there was not much scope for improvement.

The PCW is two years old (Happy Birthday to you, Happy Birthday to you – blow out the candles) at this year's PCW show. You don't get Ford sticking with the same Escort for that long and so the boys from Brentwood (home of Amstrad, just the wrong side of the M25 and too near Southend to pass itself off as civilization) has wheeled out a new model. Unlike Ford the old Joyce stays in production but having seen the development costs amortised the price drops to £299 plus VAT. The new machine is Joyce 3. Deduction reveals the Joyce 2 to be the PCW 8512. A machine which looked like an 8256 but boasted 512K RAM and a second 720K disk drive. This also has had its price pruned; to £399 plus VAT. Logic and a sense of fair play dictating that at £499 plus VAT the PCW 9512 with better bits bolted is a step above that.

Pretty

The PCW 9512 is the prettiest Amstrad machine ever. At first glance it appears to be a PC 1512, the colour is the same. But this is a deception which is laid bare by a three inch disk drive. Then you notice the other differences between the PC case and the new PCW. The monitor does not tilt, but it looks smart with 8512 holes for ventilation. The back of the monitor is better styled, and the top slopes sharply. This means that the printer will no longer fit on top of the machine but it can go either side of the main unit. Many people found that having the position of the PCW 8256 printer dictated by a short lead was a limitation. The screen is no longer green, white is considered more exective. Despite Amstrad's insistence that the screen is paper white the text is white on a black background, not inverted as on a Mac or ZX81.

I am assured that the workings of the keyboard are identical to those on the 8256, which in turn is the same as the 1512. This only goes to show what a different good keycaps make. The PCW 8256 felt cramped, I often hit keys by mistake. On the 9512 things are better spaced, the shift keys in particular are easier to get at. The large area below the spacebar shows some concern about ergonomics. Anyone who is used to an Amstrad PC will feel at home with fingers on Joyce 3, but if you are used to an earlier PCW things get confusing. The functional keys have been moved from between the QWERTY section and the numeric pad to the left where they masquerade as PC function keys.

Formidable

The 720K drive has usurped the 180K drive fitted to the elder sister. This means that like the 8256 the 9512 is a single drive machine and like the sibling it can be upgraded with the addition of a second drive, but not the same unit. A Joyce 3 with dual drives and nigh on 1.5 megabytes of disk storage is a formidable machine.

Upwards disk compatibility is maintained, so the 9512 will read 180K disks but cannot write to them, and 720K disks from the 8512 are indistinguishable by their sameness. The disks are Amstrad standard 3inch, no-one else uses these (OK, so the Tatung Einstein uses them but no-one uses a Tatung Einstein, consequently only Amstrad users buy 3inch disks). Suffice to say that Amstrad have built a standard by being bigger, and like the standards IBM establish in the same manner it's not the best but it works. Thanks to the widespread use of Amstrad disks the price has fallen to £2.99 (only twice the price of an Amiga style 3.5inch disk) from the quite ridiculous £5.

Malcolm Miller and his cronies in the Amstrad marketing department have never been modest about the abilities of the Amstrad machines, so having exhausted the terms "Near letter quality" on the PCW 8256 printer and "letter quality" on the new LQ 3500 they have been forced to call the daisywheel printer "perfect letter quality". Exaggeration apart the 9512 printer is very good, it may not be the much rumoured 24 pin dot matrix mechanism I expected but it is not as slow as the other sub £1,000 daisywheels of my acquaintance, at about 20 characters per second. The carriage is very wide, and will easily take a sheet of A4 sideways. Unfortunately the printer is very big, and not really in keeping with the sleek lines of the system unit. The size is essen-

tial for using the 9512 with a spreadsheet. On the 8256 you could condense the type, try that with a daisywheel and you end up with a mess.

Both print wheels and ribbons are freely available. The wheels and codes accepted by the printer conform to Diablo 630 protocols, the daisywheel equivalent of Epson compatible.

Expensive

There are some people who will want a faster printer, graphics or both. For them the PCW 9512 offers a centronics parallel port. There is no need for the expensive CPS 8256 interface if you do not want to attach a modem. If you do need a serial port then the interface will fit but hangs off the back like an afterthought. The 9512 is more of a typewriter replacement than the other Joyces so it is unlikely that many people will buy CPS's.

There is quite a price difference between the 8512 and 9512, particularly when you realise that it is the more expensive machine which has fewer disk drives. The price hike is justified by the inclusion of LocoScript 2, the improved wordprocessor from Locomotive Systems in Dorking. LocoScript 2 is sold separately at £20, but the 9512 also comes with LocoSpell and LocoMail. These are sold at £40 each and so the three justify the extra cost of the 9512 in themselves. I'd argue that 'Mail and 'Spell have always been disproportionately overpriced.

To drive the new printer, and any of the centronics printers you are likely to hang off the back, LocoScript 2 has a number of printer drivers. The manual suggests that you will be able to buy printer drivers for additional daisywheels and printers. I'll believe that when I see them on sale. LocoScript 2 offers 448 characters which can be printed on a PCW 8256 dot matrix printer. There is no way you will be able to find another printer or combination of daisywheels which can reproduce them all. You cannot attach an 8256 dot-matrix printer to a 9512, they are very different beasts.

Problems of printer compatibility are one of the reasons why the complete system approach of the PCW works so well. Most people will only use the Amstrad supplied printer and daisywheels with the same basic character set. I'd argue that if you really need to do a lot of printer and typeface swapping then you have bought the wrong machine. The dot matrix output of the other PCW's is not bad and much more flexible.

NEW STYLE

Repetitive

LocoScript is easy to use, you can sit down and quickly produce letters with a little help from the manual. This means that most of the users I've come across learn by doing and so miss out on loads of LocoScript's features. It is worth taking some time to learn about start-of-day disks, which reduce the time it takes to get going when beginning a session. Layouts (despite being very different from LocoScript 1 layouts) simplify the process of getting the page to look right. Blocks and Paste buffers speed up the typing of repetitive documents. If time is money then reading the manual is an investment.

LocoMail and LocoSpell help increase the value of the system. The dictionary for LocoSpell is English, based on Chambers 20th Century Dictionary as used by Scrabble players. Checking is run from inside LocoScript, which speeds up the process, suggestions are offered for incorrectly spelt words and the vocabulary can be increased through the addition of user dictionaries. The best reason for upgrading a PCW 8256 was to use the LocoSpell lexicon. The 9512 is already upgraded.

Useful

LocoMail is one of those programs which a few people will find extremely useful and the rest won't touch. Mail merging is complicated. It took me nearly a week to get what I wanted from MailMerge for WordStar. The lessons of time have meant that Locomotive learnt to make LocoMail easier to use than that but it will still take a couple of dry runs to get what you want.

It takes a programmer to stretch LocoMail, there are options to test a data file for things like outstanding balances and then insert different texts ranging from "Thank you for your prompt payment" through "this amount is now outstanding" and up to "Pay up today or we send da Boyz 'round". You choose the text, but the meaning is the same. Most LocoMail users will probably find the nuances of < > and truth tests too confusing. Programming the software is not my greatest reservation, it is the life of the printer. You could easily store enough on a 720K disk to mail over 3,000 people with customised versions of the same letter. The PCW printer would have to run for days and nights to get through that lot, only stopping for a new ribbon. This kind of hammering is more than a cheap printer should be ex-



pected to take. It is also a very long time to wait for the output. You really do need a faster and more robust printer for this kind of task. There is a tractor unit which removes the difficulty of having to feed in each sheet but no single sheet hopper, a device which would make short mailing runs possible on standard company notepaper.

All Amstrad PCW's are supplied with CP/M+. Being an old operating system there is plenty of good software, and it is amazing how many companies have benefitted from transferring forgotten products to 3 inch disks. There has even proved to be a market for rival wordprocessors. Arnor have scored quite a hit with Protext. This runs perfectly on a 9512, although a modicum of printer installation is advisable.

CP/M+ has the very useful ability to think of one disk drive as both A and B, swapping the definitions while you swap disks. The PCW has a 368K RAM Disk so you could copy files one at a time, but a whole floppy needs the features of CP/M+.

As anyone who bought a Jupiter Ace will tell you, no machine is complete without a BASIC interpreter. The language is ideal for running up the odd text processing program or complete accounts system. The PCW is supplied with a wonderful Basic. Mallard Basic was written by Locomotive software to be better than and compatible with Microsoft Basic. Mallard is fast and has a high level of mathematical precision. But it does not have any graphics of its own. You can use add-on graphics, either in the form of the Amstrad supplied GSX routines - which are a nightmare to use, or Ex-Basic from Nabitichi in Liverpool. Being a monochrome machine graphics aren't exactly the PCW's long suit. Neither is the sound, a Spectrum-like beep being the best it can muster. So Mallard is right for the PCW. What is very wrong is the inclusion of Logo, a mickey mouse language if ever I saw one.

Anyone who thinks a program which reads

pd			
lt 45	is more	DRAW	
fd 100	readable than	100,100,200,200	
pu			

either needs their head examining or is a teacher. Still it looks good in the list of bundled software and the instructions help fill the manual.

The manual is large, 624 pages and unlike early PCW manuals is bound like a book. This means it will not lie flat. Perhaps this is another way of generating revenue, because after a few weeks of use with a paperweight holding open the key pages so that you can learn how to work headers and footers. The pages make a bid for freedom. Soon the book becomes very loose leaf!

The binding apart Amstrad and Locomotive have really learned from the stick they took over the earlier manual. The new book is far better illustrated with diagrams showing what happens on the screen and which key to press. I suspect that users who upgrade from an 8256 will find the detail of the new manual tedious, but they should spare a thought for new users. We were all learner drivers once.

The PCW 9512 is the best typewriter replacement ever. It is also an OK CP/M+ computer. But if you want a bit of both the 8512 probably represents better value for money. LocoScript 2 is a vast improvement on the original LocoScript, especially when you take into account the inclusion of LocoSpell. Anyone who had reservations about the print quality of the 8256 will now be swayed. After hours there are a host of games, including the best 8 bit version of Starglider. The unanswered question is why no other computer manufacturer has brought out a machine with which to compete.

BUYING A POWERFUL PERSONAL COMPUTER IS NO LONGER A BIG ISSUE.

OR A BIG DEAL.

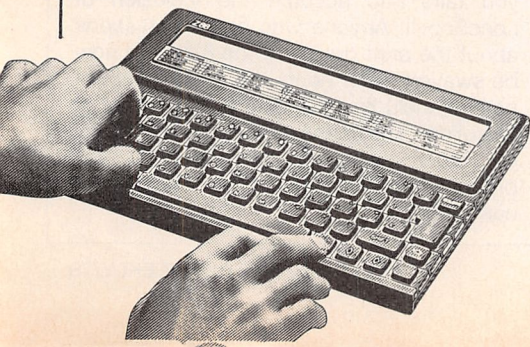
'It's very, very good.' (Simon Rockman, *Popular Computing Weekly*.)

'More than adequate for most businessmen's needs ... I propose to buy one out of taxed income.' (Michael Bywater, *Punch*.)

'... the basic machine is marvellous, good value and will sell in the thousands.' (Robert Schiffreen, *Personal Computer World*.)

The machine they're talking about is the Z88, from Clive Sinclair – the first truly portable, truly full-facility computer ever marketed.

It's less than an inch thick, and the size of an A4 pad. It weighs under 2lb. And it costs just £249.99, plus VAT.



Until now, a portable computer has been a computer you *can* carry with you. The Z88 is a computer you'll *want* to carry with you.

Wherever you are ... at home, on the move, in meetings, in hotels ... with the Z88 you can compute or word-process instantly.

The Z88 comes with 32K of RAM built in, of which around 20K is available – enough for about 2,000 words of text. This is easily expandable to 416K by simply slotting in solid-state RAM packs. And with the coming introduction of 1 Mbyte packs, total RAM of 3 Mbytes will be available – enough to hold the complete works of Shakespeare.

The resident software includes a highly powerful integrated word-processing and spreadsheet package.

Word-processing includes multi-column layout, global search and replace, and embedded calculations. Spreadsheet includes text-handling and sorting. The display shows bold, italics, underlining, and page-breaks.

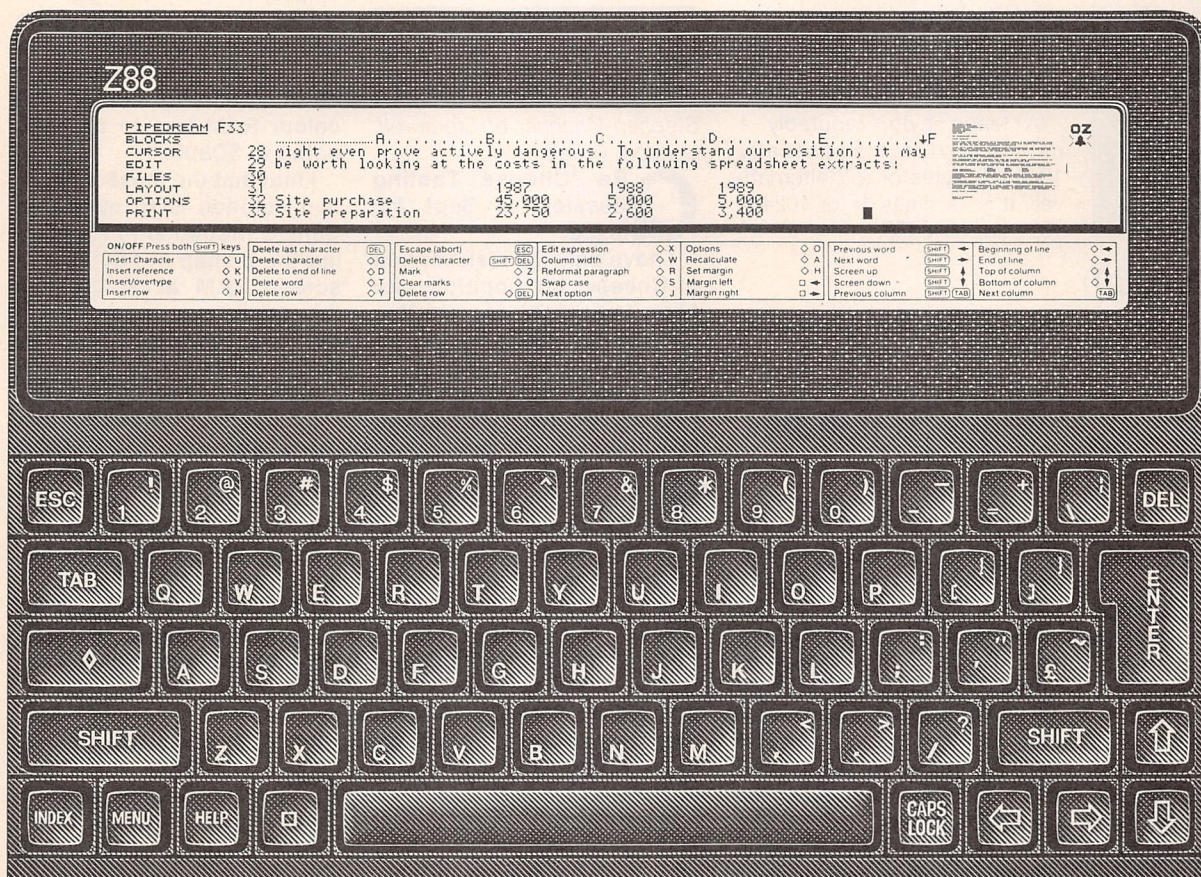
But to make a portable computer a genuine tool for personal productivity, it should provide more than word-processing and spreadsheet applications. If you're getting rid of paper, get rid of *all* your paper.

So the Z88 includes a database, calculator, free-form diary, calendar, and real-time clock and alarm. (When you put the Z88 in your briefcase, you can take just about everything else out.)

The operating software allows you to switch instantly between any of the built-in applications – such as word-processing and spreadsheet – without the delay of loading separate software into the computer's memory. With the Z88, it's just a matter of pressing a couple of keys.

New dimensions to computing, from Clive Sinclair.

Despite its compact size, the Z88 has a full QWERTY keyboard with virtually silent, short-travel keys. It includes special function keys, such as \diamond , \square , INDEX and MENU, which



Z88. £249⁹⁹_{+VAT}

make it exceptionally easy for novice users to find their way quickly around the sophisticated built-in software.

The screen is a state-of-the-art supertwist LCD, which provides a massive improvement on normal displays in both contrast ratio and viewing angle – providing a clear, sharp read-out. The screen provides a large working area of 8 lines × 94 characters.

The remainder of the screen consists of sections which hold menu details (including all the Z88's commands); a unique page map (which shows you where you are on a complete page); diary date; filing and directory details; and operating system details which give you information on the Z88's status (such as battery strength).

From the start, the Z88 was designed to incorporate every reliable idea that contributes to genuine portability. These include:

ASCII files import/export facility between the Z88 and IBM-compatible PCs (version for BBC PCs coming soon) . . .

Connection to any popular printer via a built-in printer editor and RS232 cable . . .

A serial-to-parallel converter cable for connection to non-serial printers . . .

Permanent storage on slot-in EPROM packs – up to 416K now, 3 Mbytes soon – means no moving parts, no vulnerable disks . . .

Power-saving technology to provide 20 hours active use from four AA batteries (and one year on standby) . . .

Built-in capacitor to preserve data when batteries need to be changed (mains adaptor also available) . . .

BABT-approved modem, coming soon . . .

Programming language is BBC BASIC, and the Z88 screen provides extensive graphics capability.

All this, with a comprehensive manual and carrying case. And all for a basic price of just £249.99 plus VAT!

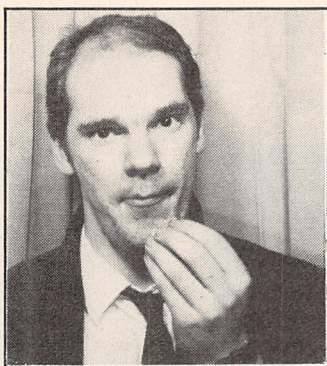
**See, try, buy the Z88 now . . .
at Dixons or Comet.**

The Z88 is available now. Mail-order customers have been using it for months. Now it's in the High Street – at Dixons and Comet, everywhere.

Look in, and try it for yourself. And see why, at £249.99, so potent a personal computer is no big deal.

**Available from
DIXONS AND COMET,
NOW.**

**C A M B R I D G E
C O M P U T E R**



with Kenn Garroch

Amiga BB

Tony Jackson, of Bexley Kent, writes:

Q I intend to open a bulletin board running on my Amiga 1000 and I hope to offer (for a closed membership fee of £5-10) as much public domain software as I can lay my hands on. Unfortunately the membership fee is to cover the cost of importing PD software from the US. To reduce costs, I thought I would offer PD software for other machines, is this possible? I know I can't run it but is it possible to upload and download software with the Amiga?

Also Amiga peripherals are much more expensive in the UK than they are in the US. Could you tell me what it entails in the way of import tax and VAT etc to import both hardware and software?

P.S. How many bytes are there in 1 Mega Byte?

A If you have an ST available then transferring files between the machines is simply a matter of hooking up an RS232 interface, and using a bit of terminal software at either end. As far as I know, you will not be able to read ST disks (or any other disks, beside Amiga, for that matter). What you need is a set protocol, say Xmodem, to make sure all of the files are compatible with other systems that will be accessing the BB. If the PD programs can be obtained in ASCII format then there should be no problems whatsoever in transferring them between machines. You might try hooking up to an ST BB and downloading some software to see how it goes?

AS far as I know, you can import anything you like from the US and all you have to pay is VAT and the p&p. This certainly applies if the goods are not for resale. However, I suspect that things may get a little more complex if you want to sell the goods you're importing.

A Mega byte, reputedly 1 million bytes, is actually 1048576 bytes or 2²⁰ alternatively it is 1k times 1k or 1024 x 1024 i.e. 1048576.

Eye of a needle

Alan S Wolstencroft, of Knutsford, Cheshire, writes:

Q Ref. PCW of 28th August "Tied up with ribbons", I have found, using a Star DP510, that for some ribbons, the eyelets are so flat that they sometimes slip through the toggle so that the tape is run to the end and is scotched and printing stops. In such case the mechanical action can be rendered more positive by careful insertion into each eyelet of a small brass paper clip of the bifurcated variety, suitably shortened with the ends folded in.

Concerning the user maintenance or printers, I find that it is possible to remove all superficial dust but there is little guidance on the removal of dust accumulating in the least accessible places—where, one supposes, it could cause real problems. Also I am uncertain as to the correct mode of lubrication, if any, of the round polished steel bar on which the printing head is carried.

Do you think PCW could publish something in the way of guidelines on printer maintenance?

A Thanks for the tip, I use 3in1 (sorry about the ad) oil on the bar in my printer which seems to work admirably. Just drip a little on when it gets too dry or begins to rattle. I suspect that the best thing is to use cotton buds (whups again) soaked in meths to get at the nooks and crannies but, as you say, there are some parts that are pretty well inaccessible without dissecting the printer. The best thing to do is keep the lid

shut as much as possible and, if you use it professionally, get a maintenance contract.

Chalk and cheese

Stephen Chance, of Stockwell, London, writes:

Q Re 'Cheese Tasting Session' in Sept 4th issue.

I have only the disk version of Cheese, but hopefully the tape version is similar enough for the following information to be of use.

The bit map, colour RAM, and screen RAM are saved by Cheese as a single program file which loads from \$8000 to \$D000. The file is so large because, with vertical scrolling, Cheese creates a picture about half as big again as the actual hires screen. The main chunk of the bitmap is at \$8000, the screen RAM at \$C200, and the colour RAM at \$C800. Also, the background colour, to be poked into \$D021, is at \$CFFD.

Unfortunately, to get a use-

ful picture out of all of this, everything has to be moved; with the bitmap at \$8000, half of it is obscured from the VIC chip by the character generator ROM image; \$C200 is the midpoint of a text screen rather than the start address of one, and of course the colour RAM has to be relocated to \$D800.

I find that the most convenient solution is to switch to Bank 3 (\$C000 \$FFFF), placing the bitmap at \$E000, and screen RAM at \$CC00. All this takes minutes in Basic, but the following machine code routine will accomplish it in the twinkling of an eye.

To use, load a cheese file into memory i.e. LOAD "A.CHE",8,1 from disk or LOAD "",1,1 from tape, load and run the program and call SYS 32508. To return to normal call SYS 32571.

Actually, I wrote the program in the hope of a tenner from 'Bytes and Pieces' but you stole my thunder.

A Sorry about that, I'll have a word with the Editor and see what can be done.

continued on page 25 ►

The Amiga 1000: software is much cheaper in the US





ZONEFOUR LTD

All disks now sent 1st class or courier



MIMIC IN FREE LIBRARY CASES

DS 96 TPI	10s	£7.60
FLIPSIDED	10s	£7.15
DS 48 TPI	10s	£6.80
UNIVERSAL	10s	£7.95

MIMIC 3.5"

SS	10s in Library Case	£13.55
DS	10s in Library Case	£15.95

AMSOFT CF2 3"	10s	£20.00
MAXELL CF2 3"	10s	£20.00
3" MIMIC CF2DD	10s	£26.40

ACCESSORIES INC VAT

IBM/Amstrad PC1512 Printer Cable GPR10125 x cent.	£7.15
Disk Notcher/doublers	£3.60
Disk cleaners 3.5"	£3.95
5.25" cleaner	£3.60
Mini Vac for printers and keyboards	£5.55

5.25" BULK UNBRANDED DISKS (LIFETIME GUARANTEE)

FULLY CERTIFIED	SS 48 TPI	SS 96 TPI	DS 48 TPI	DS 96 TPI
Try 10 and see	£4.75	£5.55	£5.55	£6.35
25	£9.60	£10.40	£10.40	£11.20
50	£18.40	£19.20	£19.20	£20.80
100	£33.60	£35.20	£35.20	£36.80
250	£76.00	£77.60	£77.60	£80.00
500	£144.00	£148.00	£148.00	£152.00

5.25" BULK COLOUR UNBRANDED

FULLY CERTIFIED	SS 48 TPI	SS 96 TPI	DS 48 TPI	DS 96 TPI
10*	£7.15	£7.95	£7.95	£8.75
25	£17.60	£19.20	£19.20	£20.80
50	£32.00	£36.00	£36.00	£38.40
100	£60.00	£64.00	£64.00	£72.00
250	£140.00	£152.00	£152.00	£160.00
500	£272.00	£208.00	£208.00	£300.00

RED, GREEN, BLUE, YELLOW, WHITE

10 in single colour OR 2 of each please state in large quantities your choice. (If stocks are available) * in library cases

NEW CATALOGUE AVAILABLE NOW

3.5" BULK UNBRANDED DISKS 135 TRILIFETIME GUARANTEE

	SS	DS
10	£11.95	£13.55
25	£28.00	£32.00
50	£52.00	£64.00
100	£96.00	£120.00
250	£220.00	£280.00
500	£400.00	£520.00

MIMIC HIGH DENSITY COBALT COATED 1.6 MEG SUITABLE FOR A.T.S.

10	50	100
£14.40	£64.00	£120.00
Verbatim preformatted for use with Kodak 6.6 meg drive or equivalent (5 Pack)		
		£90.00

DISK BOXES INCLUDING VAT

5.25"	50 capacity £6.95	100 capacity £9.35
3.5"	40 capacity £6.80	80 capacity £9.55
3"/3.5"	80/90 capacity £9.55	
10 x 3.5" or 5.25" (library case)	£1.20	

AMIGA HARDWARE

A500 Amiga	£475.00
Cumana compatible 1 meg disk drive	£140.00
Modulator	£24.95

SOFTWARE

We sell the full range of SAGE POPULAR SOFTWARE	
ABC All in One Business Package	£150.00

ALL 5.25" DISKS HAVE REINFORCED HUB RINGS, SLEEVES, LABELS AND WRITE PROTECTS.

ALL DISKS CARRY A LIFETIME GUARANTEE.

ALL DISK PRICES INCLUDE VAT AND P/P.

TO ORDER PLEASE CALL DIRECT DISK LINE: 10AM 6PM

Please Note: We can now offer you a duplicating service and in-house printing, packaging and most services you require. If you require any of these services, please telephone for a quotation on 0707 331076.

ZONEFOUR, Unit 11, Mundells Court, Welwyn Garden City, Herts. Tel: 0707 334460

Please call for bulk and seasonal prices and a full list of Paper, Labels, etc. etc. and new catalogue

LIBERTY MEGASTORE™ 30 MB HARD CARD

Simple fitting – Fitting in Expansion Slot

Very Low (9W) Power Consumption

Use as Drive C with Twin Floppies

1 Year Warranty on all products

* 45 MB Version on request

£299

LIBERTY HARDISK UPGRADE KITS

Comprises Seagate 5¼" + DTC Controller + Cable +
Screws

20 MB Kit £275

30 MB Kit £290

40 MB Kit £390

60 MB Kit £490

AMSTRAD Fixing Kit £ 10

* 3½" Winchester Kits on request

LIBERTY TAPE STREAMING UNITS

Archive FT60 XT External 60 MB inc PSU & Cables £599

Archive 5¼" Scorpion Internal 60 MB inc Fitting Kit £599

Archive 3½" Jaguar Internal 40 MB £299

* Prices include MSDOS Software and cartridge

* Novel Software & X UNIX Software available

LIBERTY EGA CARDS (PARADISE)

CGA/EGA, Plantronics, MDA, Hercules compatible

LIBERTY 6 640 x 480 pixels Auto switch £199

LIBERTY 4 640 x 480 pixels Keyboard switch £179

LIBERTY 3 640 x 350 pixels Auto switch £159

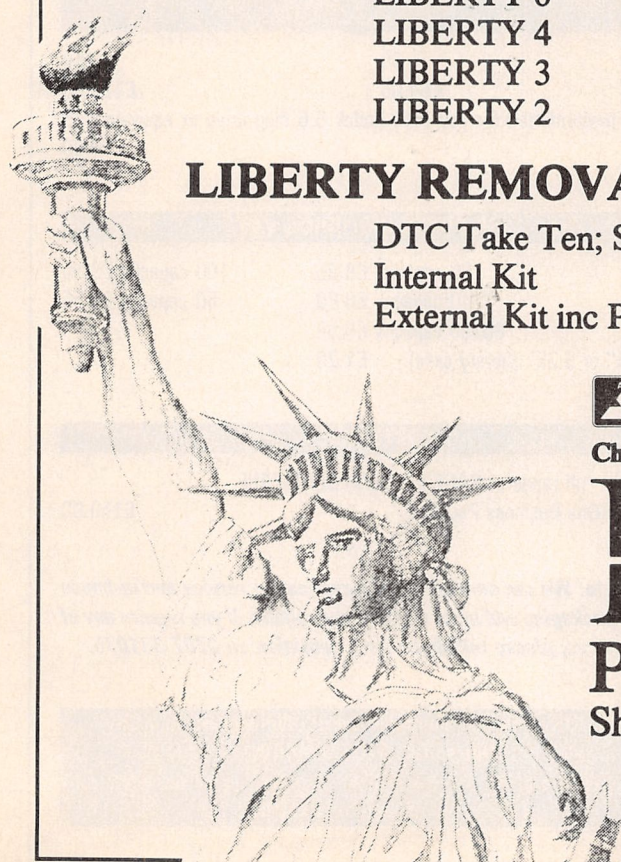
LIBERTY 2 640 x 350 pixels Keyboard switch £139

LIBERTY REMOVABLE 10 MB CARTRIDGE DRIVE

DTC Take Ten; Software; Cables; Controller & Cartridge

Internal Kit £430

External Kit inc PSU & 2 slot case £520



Prices Include P & P

Prices Exclude VAT

Cheques made payable to:

LIBERTY

PERIPHERALS LIMITED

Shirley Lodge, 470 London Rd., Slough SL3 8QY

Tel: 0753 686805 or 681017 Telex: 847185

Fax: 0753 686819 or 40990

◀ continued from page 22

STicky, mouse

John Grimaldi, of Thornton Heath, London, writes:

Q I have had my ST for some months now and have just begun to experience problems with the Mouse. It has started to become very inaccurate, and has a sort of lumpy feel, I have an idea that it may need cleaning but I don't want to take it apart for reasons of warranty. Is this a common problem and how do I solve it?

A Turn the mouse over and you will see a section with two arrows on it. Push the section in the direction indicated and it will come off. Don't worry about it; that's what it's meant to do. Remove the ball and give it a wipe.

Next, peep inside and you will see three rollers, one for the x direction, one for the y direction, and one to keep things steady. These rollers should be silvery coloured, if they're not then they need cleaning.

The best way to remove the gunge is to scrape the rollers with a screwdriver or knife until they are gleaming again. Polish up with a bit of meths or lighter fuel if you like; but *don't* get it on the ball or the plastic bits, because it isn't at all good for them in the longer term. Try not to get too much gunge inside the mouse as this will eventually muck up the whole of the works.

If you clean the beastie once a month or so, you shouldn't have too many problems. If the mouse begins to squeak then you have got troubles, the best solution for which is a cage.

Character assassination

Stephen Howlett, of Morriston, Swansea, writes:

Q Is it possible to change the Spectrum's character set? I have designed a new set of numbers and letters using UDGs and I can change the Spectrum's to mine. The trouble is that I



Some would say that the Spectrum's character remains the same whatever you do to it...

can only use 23 UDGs so I hope you can help.

A In the system variables there is a pointer to the character set which normally points to the ROM definitions. Change this to point to RAM, and the whole set can be redefined. Locations 23606 (low byte) and 23607 (high byte) hold the address 256 less than the start of the actual definitions. The first 32 characters (0-31) are control codes and therefore do not have shape definitions so, $8 \times 32 = 256$ i.e. the gap before the first character, space (32). Characters are defined on an 8×8 matrix of dots e.g.

```
00000000
00011000
00111000
00011000
00011000
00011000
01111110
01111110
```

Would define the 1 character shape. The following program demonstrates how this can be done from Basic: it copies the character set from Rom to RAM and redefines part of the A definition.

```
10 CLEAR 39999
20 PRINT "AAAAAA"
30 PRINT "CHARS NOW AT"
40 PRINT PEEK(23606),
PEEK(23607)
```

```
50 PRINT "I.E.",PEEK(23606)+
PEEK(23607)*256
60 FOR T=0 TO 127*8
70 POKE 4000+T, PEEK(15616
+T)
80 NEXT T
90 POKE 23607,INT ((4000
-256)/256)
100 POKE 23606,4000-256*INT
(4000/256)
110 PRINT "REDEFINE PART
OF A"
120 POKE 39744+(8*65),255
130 PRINT "AAAAAA"
```

RS232

D P Berkley, of York Electronic Research, The Fishergate Centre, 4 Fishergate, Yorks, writes:

Q I am writing in reply to Christopher Adams' letter in the August issue of PCW concerning problems encountered in connecting a ZX-81 to a Brother printer.

The Brother range of printers support both hardware handshaking and X-on Xoff protocol, but unfortunately

these mutually exclusive formats have been implemented in such a way as to prevent communication if the printer is not given a CTS signal, which requires modification to the D connector wiring, in order to overcome this problem the following connections should be made: Pin 2 TX printer --> controller Pin 3 RX controller --> printer Pin 7 OV i.e. ground Pin 20 RTS o/p low when printer is busy pins 4, 5, 6, 8 should be connected together.

Y.E.R. will provide a cable specially wired for Brother printers with our Commodore C64/C128/Plus 4 RS232 interface for no extra cost. If any readers have difficulty in interfacing Commodore computers to Brother RS232 printers we would be happy to discuss technical problems. Phone 0904 610722.

A Ta.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem Peek it to Kenn Garroch and every week he will Poke back as many answers as he can. The address is Peek & Poke, PCW, 3rd Floor, Greencoat House, Francis Street, London SW1P 1DG.

Last week I mentioned that it is possible to use a sound chip to synthesize real sounds using amplitude modulation, changing the value in the volume register according to the waveform to be produced. The sounds produced were defined using sine synthesis, ie combinations of sine waves. Wave forms can also be defined from programming, some by using sampling devices known as ADCs (Analogue to Digital Converters). An ADC measures the amplitude or volume of a waveform at specific intervals returns the values as binary numbers on a data bus. These can be read into the computer and used with the sound chip or a DAC (Digital to Analogue Converter) to reproduce them. Sampled sounds can also be modified with computer programs to produce filters, echos, frequency changes etc. The crucial factor about ADCs is the speed at which they can convert the incoming waveform. For example, take a sine wave of 440Hz, if its amplitude was measured every second,

0-15 so the signal must be reduced 16 times to output it via this method. This reduces the quality, but an eight bit DAC will reproduce the sound, more or less, at the quality at which it was sampled.

An eight bit DAC simply converts values from 0-255 into voltages with the same increment, i.e. if the output is to vary between 0 and 5V then the DAC will split this into 256 steps or units of 0.02V.

There are a number of commercial ADC/DAC units available for home micros, generally used for speech synthesis. They can record sounds which are stored in memory, and then reproduce them in normal or modified form (see ST Update September-November 1987 for a circuit that is easily adapted to any micro with an i/o port).

ADC/DAC systems are used along with special speech chips because of the amount of information contained in the spoken word. A speech synthesis chip normally uses phonemes, or parts of word sounds, to create its vocabulary. All words

having each word available in memory because they take up so much less space. Consider a sampled word that lasts half a second sampling at 40kHz into eight bits produces 20000 bytes, quite a lot of memory even by today's standards.

Storing phonemes themselves takes up a lot of space, the thing is that the data is held in ROM is a special chip that includes the DAC and all of the gear necessary to reproduce the sound. All the programmer has to do is select the required sequence of phonemes to produce the desired word. Most words will split into less than 5 or 6 phonemes so the computer is not handling very much data.

The main drawback with speech synthesis chips is that they tend to be rather robotic and usually have American accents - the BBC micro speech chip is an exception in that it uses a British news reader as its basis. The main problem with phonemes is that they don't convert from text to sound, as spelling is inconsistent.

The last waltz

In the fourth and last part of his series on computer sound, Kenn Garroch looks at analogue to digital converters and speech.

the resulting set of numbers would be meaningless. Taking samples every 2.3ms i.e. 440 times a second is better but they will not look or sound like a sine wave.

To gain the best result, the sampling frequency must be at least twice the frequency being sampled e.g. 440Hz needs to be sampled at at least 880Hz or every 1.1ms to produce a result that at least represents the correct frequency on playback, ideally, higher sampling frequencies than this are desirable, and when using ADCs to sample sounds that can be heard i.e. in the range 20-20kHz, they must do a conversion at least once every 25µs. This should cover all the audible frequencies but will cause most computers and ADCs some problems. There are, however, ADCs that will operate at these frequencies and reproduce a respectable result.

Translating the sounds back from numerical to audible form can be done either with a sound chip as described before, or with a DAC which will produce a far superior result. Since eight bits is a convenient number format for computers, most ADCs quantify the amplitude of a sampled signal into values from 0-255 which can be read directly into a computer user port and stored quite conveniently in memory. Most sound chips only allow volume values from

can be broken down into sections, each of which is a distinctive sound, and can be recombined in different ways to produce reasonably intelligible speech. These phonemes (or, more accurately, allophones) are much more suited to speech synthesis than

```
100 REM SYS 32508 TO VIEW CHEESE FILE
110 REM SYS 32571 TO VIEW TEXT
120 POKE 55,251:POKE 56,126:CLR
130 A=32508:B=200
140 FORZ=0TO21:C=0:FORV=0TO11
150 READD:C=C+D:IF D<256 THEN POKER,D
160 A=A+1:NEXT
170 READD:IFC<D THEN GOSUB190
180 B=B+10:NEXT:END
190 PRINT"ERROR IN LINE"B:RETURN
200 DATA 32,9,127,32,105,127,32,155,127,32,205,127,1110
210 DATA 96,173,2,221,9,3,141,2,221,173,17,208,1266
220 DATA 9,32,141,17,208,173,0,221,41,252,141,0,1235
230 DATA 221,173,22,208,9,16,141,22,208,169,56,141,1386
240 DATA 24,208,173,33,208,141,255,127,173,253,207,141,1943
250 DATA 33,208,96,173,2,221,9,3,141,2,221,173,1282
260 DATA 17,208,41,223,141,17,208,173,0,221,41,252,1542
270 DATA 9,3,141,0,221,173,22,208,41,239,141,22,1220
280 DATA 208,169,21,141,24,208,173,255,127,141,33,208,1708
290 DATA 96,169,0,133,251,169,128,133,252,169,0,133,1633
300 DATA 253,169,224,133,254,160,0,177,251,145,253,165,2184
310 DATA 253,201,63,208,7,165,254,201,255,208,1,96,1912
320 DATA 230,251,208,2,230,252,230,253,208,2,230,254,2350
330 DATA 76,123,127,169,0,133,251,169,194,133,252,169,1796
340 DATA 0,133,253,169,204,133,254,160,0,177,251,145,1879
350 DATA 253,165,253,201,232,208,7,165,254,201,207,208,2354
360 DATA 1,96,230,251,208,2,230,252,230,253,208,2,1963
370 DATA 230,254,76,173,127,169,0,133,251,169,200,133,1915
380 DATA 252,169,0,133,253,169,216,133,254,160,0,177,1916
390 DATA 251,145,253,165,253,201,255,208,7,165,254,201,2358
400 DATA 219,208,1,96,230,251,208,2,230,252,230,253,2180
410 DATA 208,2,230,254,76,223,127,234,85,256,256,256,2207
```

All in all, there is a lot that can be done with sounds and computers. It is difficult to cover it all in a few articles. Any detailed description has to be machine specific since there is no standardisation. I have tried to give an overall view.

In four years, the consumer software business has emerged as a rapidly growing technology-driven entertainment industry and Electronic Arts has been highlighted as its business and creative leader. With a dynamic management style, the company has developed to a stage where they are now the most widely respected brand name in the American consumer software market.

Electronic Arts is expanding its operation to the UK and European markets and, consequently, has vacancies for the following key roles:

SALES ADMINISTRATOR
c.£12,000 + benefits

A dynamic, experienced Sales Administrator is required to assist in the direction, control and monitoring of a growing field sales team and telesales and dealer services units. You will be acting on behalf of and reporting to the European Sales Manager.

SECRETARY c.£7,500 + benefits

Bright, competent secretary to support busy European Publishing Director. Fast, accurate word-processing abilities essential. Good administration and communication skills required for this varied and interesting role.

Please write, enclosing CV, to:

Julie Lingley
Electronic Arts Limited
Langley Business Centre
11-49 Station Road
Langley, Nr Slough
Berkshire SL3 8YN
Tel. (0753) 49442



ELECTRONIC ARTS®
Home Computer Software

CUSTOMER SERVICES c.£8,000 + benefits

Bright, literate games enthusiast required to join small, busy team. Department handles customer enquiries, quality control on existing products, testing of new products, and warranty card logging. Candidates must be able to work on their own initiative, and frequently under pressure. Some knowledge of Amiga/Atari ST/IBM computers and Electronic Arts products a distinct advantage.

TELEPHONES SALES c.£8,000 + bonus + benefits

Working within our new and dynamic sales department you will be obtaining orders from established and potential customers. With at least 6 months' telephone sales experience with retail/wholesale outlets, we expect you to maintain sales records, process orders and gather marketing information. Education to 'O' level standard or ideally have equivalent business qualifications.

DEALER SERVICES c.£6,000 + benefits

Two bright, young, intelligent persons, preferably educated to 'A' level standard, to handle important dealer services function, involving day-to-day telephone contact with our customers in the UK and overseas. Keyboard skills an advantage.

PROGRAMMING: AMSTRAD CPC

Newsmaker

Simon T Goodwin

Desktop publishing involves the design, manipulation and printing of a page of text and graphics. Posters, adverts or newsletters can be produced with ease and stored for future use. The computer stores the page in memory (one page takes 51K) and the user can work on one third of the page at any one time. Switching between the three parts of the page is quick and easy.

To get the program up and running you must type in two programs. Program I is Basic, while Program II is a machine code listing. Run Program II first. This pokes in the machine code data. If errors are found a message will be displayed. If the data has been typed in correctly a file "pager.bin" will be saved onto the disc. Program II can then be deleted. Running Program I loads the machine code and enters the main program. Remember this program is 6128 only. It may run on an expanded 464/664 but the commands prefixed by a ":" may need to be altered.

Newsmaker is menu driven throughout. To move the pointer use the cursor keys. The Copy keys selects an option from the menu. Pressing the Esc key returns to the main menu. The main menu headings are Text, Graphics, Banner, Files, Print and Miscellaneous and are displayed at the top of the screen.

Text

Upon selecting this option you are greeted with three options: Load File, Enter Text and Exit. (An exit option is included on all sub-menus. Selecting it returns to the main menu). The Load File option can be used on word-processor files (Protext Program files and Mini Office II files work) or ordinary ascii files. Move the cursor to the position you want the text to appear at and press Copy. Then type the name of the program. If you

load text into a shape (say as triangle) it will fill it. Whenever the program runs out of space it displays an overflow menu. Then you can either return to the menu or chose another position to start printing more text. The Enter Text option lets you type text directly on screen. The Cursor keys and the Delete key can be used to move the cursor. Pressing Clr returns to the main menu.

Graphics

This is perhaps the most rewarding way of using this program. A number of options are available: Dot mode, Line mode, Fill, Spray, Cut and Paste. The Dot and Spray modes can be used to write or erase (type E or W when the menu appears). Pressing Copy produces either a dot or a spray pattern depending on which option you use. Line mode surprisingly enough allows lines to be drawn. Use cursors and Copy to set the location of one end of the line, then do the same for the other end of the line. To use the Fill option you must already have moved the cursor to the required position. Be careful here as one false move can ruin your designs. The Cut and Paste options allow you to move chunks of graphics and text from one screen location to another. To Cut you must set the position, width and depth of the area to be cut using the Cursors and Copy. The Paste option allows you to display the graphics you have cut anywhere on the screen. You must set the position to paste, again using Cursors and Copy. You can even move text from one of the three screens to another.

As this is a three week listing, more instructions are given next week. Also, if you'd like a copy of *Newsmaker* on disc then send £7.00 to 41 Fountains Drive, Acklam, Middlesbrough, Cleveland TS5 7LW.

```
10 REM *****
20 REM *** NEWSMAKER Program I ***
30 REM *** ST Goodwin August 1987 ***
40 REM *****
50 REM
60 ON ERROR GOTO 4720
65 ON BREAK GOSUB 4730
80 SYMBOL AFTER 32
90 MEMORY 37999
100 MODE 2
110 LOAD "pager":CALL 38000
120 !BANK,5: !MOVE,49152,16384,16384: !BAN
K,0
130 !BANK,6: !MOVE,49152,16384,16384: !BAN
K,0
140 !BANK,7: !MOVE,49152,16384,16384: !BAN
K,0
150 !BANK,0
160 MODE 2:PAPER 0:PEN 1:BORDER 13:INK 0
,26:INK 1,0
170 :
180 :
190 DEFINT a-z:DIM b(12),cf(80,2):FOR a=
0 TO 6:b(a*2)=2^(6-a):NEXT
200 storex=100:storey=100:dense=5:scrn=1
210 z=20000:pas=25000
220 :
230 :
240 WHILE 1
250 error=0
260 PEN 1
270 RESTORE 4650
280 LOCATE 1,1:PRINT SPACE$(80)
290 LOCATE 1,2:PRINT SPACE$(80)
300 TAG:FOR n=30 TO 600 STEP 96:MOVE n,3
90:READ a$:PRINT a$;:NEXT:TAGOFF
310 PLOT -5,-5,1
320 PLOT 3,368:DRAWR 632,0:DRAWR 0,28:DR
AWR -632,0:DRAWR 0,-28
330 a%=0: !MENU,6,1,1,0,0,28,390,@a%
```

```
340 ON a% GOSUB 390,1380,2430,2740,3460,
3960
350 WEND
360 END
370 :
380 :
390 !CUT,49152+160,z,20,100
400 !FWINDOW,55457,13,90,0
410 PLOT 10,360:GOSUB 4590
420 RESTORE 4660: !UPRINT,20,346,"Text"
430 TAG:FOR n=1 TO 3:READ a$:MOVE 20,330
-(n*16):PRINT a$;:NEXT:TAGOFF
440 a%=0: !MENU,3,0,0,1,1,20,314,@a%
450 !PASTE,49152+160,z,20,100
460 IF a%=2 THEN GOSUB 520
470 IF a%=1 THEN GOSUB 740
480 IF a%=3 THEN RETURN
490 RETURN
500 :
510 :
```

```
520 GOSUB 1030
530 rt=1:GOSUB 2660:rt=0:FOR n=1 TO 255:
CALL &BB1B:NEXT
540 mk=1:stx=x:sty=y:LOCATE x,y:CALL &BB
B1
550 WHILE 1
560 a%=INKEY$
570 IF a%=CHR$(127) THEN GOSUB 690:GOTO
600
580 IF x=80 AND y=25 THEN 600
590 IF a%<>" " THEN IF ASC(a%)<240 THEN
LOCATE x,y:PRINT a$;:x=X+1
600 IF x=80 AND y<25 THEN cf(mk,1)=x:cf(
mk,2)=y:mk=mk+1:x=stx:y=sty+1
610 IF a%=CHR$(13) AND y<25 THEN cf(mk,1
)=x:cf(mk,2)=y:mk=mk+1:x=stx:y=sty+1:LOCAT
E X,Y
620 IF a%=CHR$(240) AND y>sty THEN PRINT
CHR$(11);:y=y-1
```


PROGRAMMING: AMSTRAD CPC

```

630 IF a$=CHR$(241) AND y<25 THEN PRINT
CHR$(10);:y=y+1
640 IF a$=CHR$(242) THEN GOSUB 1000
650 IF a$=CHR$(243) AND x<80 THEN PRINT
CHR$(9);:x=x+1:IF x=80 AND y<25 THEN x=
tx:y=y+1:LOCATE stx,y
660 IF mk=80 THEN CALL &BBB4:RETURN
670 IF a$=CHR$(810) THEN CALL &BBB4:RETU
RN
680 WEND
690 IF x=stx AND y=sty THEN RETURN
700 PRINT CHR$(8);" ";CHR$(8);:IF x=stx
THEN x=cf(mk-1,1)-1:y=cf(mk-1,2):mk=mk-1
:LOCATE x,y:PRINT CHR$(16);CHR$(8);:ELSE
x=x-1
710 LOCATE x,y:RETURN
720 :
730 :
740 ex=0:GOSUB 1030:rt=1:GOSUB 2660:rt=0
750 tx=x:ty=y:LOCATE tx,ty
760 x2=(x*8)-8:y2=((25-y)*16)+16:stx=x2
770 :CUT,49152+160,z,42,60:FWINDOW,5545
7,40,50,0:MOVE 10,360:GOSUB 4600
780 WINDOW 4,40,4,8:FOR n=1 TO 255:CALL
&BBB1B:NEXT
790 INPUT "Filename ",f$
800 IF f$="" OR LEN(f$)>8 THEN 790
810 :PASTE,49152+160,z,42,60:WINDOW 1,80
,1,25
820 mkr=0:OPENIN(f$)
830 WHILE NOT(EOF)
840 LINE INPUT #9,a$(1)
850 FOR n=1 TO LEN(a$(1))
860 IF ASC(MID$(a$(1),n,1))=0 THEN PRINT
CHR$(7):x=tx:y=y+1:x2=stx:y2=y2-16:GOSU
B 1330:IF df=1 THEN GOSUB 1140:ELSE IF y
<26 THEN PRINT:GOTO 910
870 LOCATE x,y:PRINT MID$(a$(1),n,1);
880 x=x+1:x2=x2+8
890 IF x=81 THEN x=tx:y=y+1:x2=stx:y2=y2
-16:GOSUB 1330:IF df=1 THEN GOSUB 1140:E
LSE IF y<26 THEN PRINT:GOTO 910
900 GOSUB 1300:IF df=1 THEN x=tx:y=y+1:x
2=stx:y2=y2-16:GOSUB 1330:IF df=1 THEN G
OSUB 1140:ELSE IF y<26 THEN PRINT
910 IF y=26 THEN GOSUB 1140
920 IF ex=1 THEN GOTO 970
930 NEXT x:tx=x:y=y+1:x2=stx:y2=y2-16:GOSU
B 1330:IF df=1 THEN GOSUB 1140
940 IF y<26 THEN PRINT:ELSE GOSUB 1140
950 WEND
960 CLOSEIN
970 RETURN
980 :
990 :
1000 IF x>stx THEN PRINT CHR$(8);:x=x-1:
RETURN
1010 IF x=stx AND y>sty THEN x=79:y=y-1:
LOCATE x,y:RETURN
1020 RETURN

1030 FOR n=1 TO 255:CALL &BBB1B:NEXT:GOSU
B 2340
1040 WINDOW 1,80,1,25
1050 LOCATE 15,5:PRINT "MOVE CURSOR AND
PRESS COPY TO"
1060 LOCATE 15,6:PRINT "LOCATE TEXT."
1070 LOCATE 15,8:PRINT "Press a key"
1080 WHILE INKEY$="" :WEND
1090 :PASTE,49152+160+13,z,40,100
1100 x=storex:y=storey:GOSUB 4390:storex
=x:storey=y
1110 RETURN
1120 :
1130 :
1140 :CUT,55457,z,42,60
1150 :FWINDOW,55457,40,56,0:MOVE 10,360:
GOSUB 4600:WINDOW 4,40,4,8
1160 ex=0
1170 INPUT "Do you want to (E)xit or (S)
end the rest of the text to another pla
ce ";e$
1180 e$=LOWER$(e$)
1190 IF e$="e" THEN ex=1:CLOSEIN:WINDOW
1,80,1,25: :PASTE,55457,z,42,60:RETURN
1200 IF e$<>"s" THEN 1170
1210 :PASTE,55457,z,42,60
1220 GOSUB 1030
1230 rt=1:GOSUB 2660:rt=0
1240 tx=x:ty=y:LOCATE tx,ty
1250 mkr=0
1260 x2=(x*8)-8:y2=((25-y)*16)+16:stx=x2
1270 RETURN
1280 :
1290 :
1300 df=0:FOR tgh=x2+8 TO x2+16
1310 IF TEST( tgh,y2-8) <>0 THEN df=1
1320 NEXT:RETURN
1330 df=0:FOR tgh=y2-2 TO y2-16 STEP 2
1340 IF TEST( x2+4,tgh) <>0 THEN df=1
1350 NEXT:RETURN
1360 :
1370 :
1380 :CUT,49152+160+13,z,20,100
1390 :FWINDOW,55469,13,90,0
1400 PLOT 105,360:GOSUB 4590
1410 RESTORE 4670:UPRINT,120,346,"Graph
ics"
1420 TAG:FOR n=1 TO 7:READ a$:MOVE 120,3
30-(n*16):PRINT a$;:NEXT:TAGOFF
1430 aZ=0:IMENU,7,0,0,1,1,120,316,eaz
1440 :PASTE,49152+160+13,z,20,100
1450 ON aZ GOSUB 1490,1630,1730,1770,187
0,2130,2310
1460 RETURN
1470 :
1480 :
1490 GOSUB 2340:INPUT "(W)rite or (E)ras
e";e$:e$=LOWER$(e$)
1500 IF e$="w" THEN penn=1:GOSUB 2400:EL
SE IF e$="e" THEN penn=0:GOSUB 2400:ELSE
GOSUB 2400:GOTO 1490

```

```

10 REM -----
20 REM - Newsmaker Program II -
30 REM - By Simon.T.Goodwin 1987 -
40 REM -----
50 REM
60 MEMORY 37999
70 linenumber=210:address=38000
80 FOR n=1 TO 161
90 count=0
100 FOR i=0 TO 7
110 READ a$:POKE address,VAL("&"a$)
120 address=address+1
130 count=count+VAL("&"a$)
140 NEXT i
150 READ check$:check=VAL("&"check$)
160 IF count<check THEN PRINT "Error in
line";linenumber:END
170 linenumber=linenumber+10
180 NEXT n
190 REM
200 SAVE "pager",b,38000,1288
210 DATA 01,7A,94,21,E0,94,CD,D1,442
220 DATA BC,C9,A0,94,C3,75,95,C3,549
230 DATA 9F,95,C3,DF,95,C3,C9,95,58C
240 DATA C3,6D,96,C3,10,96,C3,C3,485
250 DATA 96,C3,2E,97,C3,F5,98,C3,531
260 DATA FC,98,C3,0F,95,C3,11,99,468
270 DATA 43,55,D4,50,41,53,54,C5,369
280 DATA 54,43,4F,4F,52,C4,47,43,2D5
290 DATA 4F,4F,52,C4,45,4D,50,48,2DE
300 DATA 41,53,49,5A,C5,55,50,52,2F3
310 DATA 49,4E,D4,44,50,52,49,4E,2EB
320 DATA D4,4D,45,4E,D5,42,41,4E,35A
330 DATA CB,4D,4F,56,C5,46,57,49,368
340 DATA 4E,44,4F,D7,4C,4F,41,C4,358
350 DATA 00,00,00,00,00,00,00,00,0
360 DATA 00,00,00,00,00,00,00,00,0
370 DATA 00,00,00,00,00,00,00,00,0
380 DATA 00,00,00,00,00,00,00,00,0
390 DATA 00,00,00,FE,00,00,00,00,FE
400 DATA 01,01,01,01,00,00,00,DD,E1
410 DATA 6E,06,DD,66,07,DD,4E,02,2EB
420 DATA DD,46,04,DD,7E,00,32,03,2B7
430 DATA 95,CD,F6,95,C9,C5,E5,1A,57A
440 DATA 77,23,13,10,FA,E1,01,00,299
450 DATA 08,09,30,04,01,50,DD,09,15F
460 DATA C1,DD,20,E9,C9,7A,2F,57,3A0
470 DATA 7B,2F,5F,13,E5,AF,67,6F,386
480 DATA E3,7A,B3,20,02,E1,C9,06,3E2
490 DATA 11,CB,15,CB,14,38,10,10,22B
500 DATA F8,1B,14,E3,E5,19,30,01,336
510 DATA E3,E1,E3,CB,15,CB,14,E3,549
520 DATA CB,15,CB,14,E3,10,ED,D1,46F
530 DATA CB,2A,CB,1B,C9,DD,6E,06,3F5
540 DATA DD,66,07,DD,5E,04,DD,56,38C
550 DATA 05,DD,4E,00,DD,46,02,C5,31A
560 DATA E5,7E,12,23,13,10,FA,E1,396
570 DATA 01,00,08,09,30,04,01,50,97
580 DATA C0,09,C1,DD,20,E9,C9,DD,446
590 DATA 6E,06,DD,66,07,DD,5E,04,2FD

```


"WE ARE OFFICIAL COMMODORE DEALERS"



COMMERCIAL AND COMPUTER SERVICES LIMITED 01-549 3028

Amiga Titles	29.00	Leaderboard	20.00	Colourspace	16.00
Bureaucracy	29.00	Leaderboard Tourn.	20.00	Cards	16.00
Golf	29.00	Mean 18	24.00	Electronic Pool	16.00
Hacker	20.00	Super Huey	15.00	Flipside	16.00
Portal	24.00	Apshai Trilogy	20.00	Goldrunner	20.00
Shanghai	20.00	World Games	20.00	Karate Kid II	20.00
Tass Times	20.00	Anco Games	10.00	Lands Of Havoc	16.00
Witness	25.00			Major Motion	16.00
7 Cities Of Gold	25.00			Mud Pies	16.00
Archon 2	25.00			Pinball Factory	20.00
Adventure Cons. Set	25.00			Super Conductor	35.00
Arctic Fox	25.00			Time Bandits	25.00
Marble Madness	25.00			Trivia Challenge	15.00
One To One	25.00			Silent Service	20.00
Skyfox	25.00			Crusade In Europe	20.00
The Pawn	20.00			F15 Strike Eagle	16.00
Guid Of Thieves	20.00			Ultima III	20.00
Fairy Tale Adventure	39.00			Balance Of Power	25.00
Borrowed Time	20.00			Black Cauldron	30.00
Cut Throats	24.00			Kings Quest 2	30.00
Deadline	24.00			SDI	20.00
Enchanter	24.00			Strike Force	20.00
THHGTC	24.00			Hades Nebula	16.00
Infidel	24.00			Mercenary	20.00
Leather Goddesses	24.00			Arkanoid	12.00
Mindshadow	20.00			Chess	20.00
AMFV	27.00			Football Fortunes	20.00
Moon Mist	24.00			Golden Path	30.00
Music Studio	29.00			Arena/Brattacus	30.00
Planetfall	24.00			Deep Space	20.00
Seastalker	24.00			Jewels Of Darkness	20.00
Sorcerer	24.00			Guid Of Thieves	20.00
Spellbreaker	24.00			The Pawn	20.00
Starcross	24.00			Check Mate	12.00
Suspect	24.00			Terrestrial Encounter	12.00
Suspended	24.00			Games Compendium	20.00
Trinity	27.00			Liberator	10.00
Witness	24.00			Mousetrap	12.00
Wishbringer	24.00			Plutos	12.00
Zork I	24.00			Apshai Trilogy	20.00
Zork II	24.00			Alternate Reality	20.00
Zork III	24.00			Dungeon Reality	20.00
Silent Service	20.00			POA	20.00
Ultima III	20.00			Championship Wrest.	20.00
Balance Of Power	30.00			Phantasia II	20.00
Defender/Crown	25.00			Metross	20.00
Deja Vu	24.00			Barbarian	20.00
Sinbad	25.00			Questprobe	15.00
SDI	24.00			Roadrunner	24.00
Uninvited	24.00			Roadwar 2000	20.00
Arena/Brattacus	25.00			Rogue	15.00
Deep Space	24.00			Super Huey	15.00
Silicon Dreams	15.00			Super Cycle	20.00
Starglider	15.00			Super Tennis	20.00
Hollywood Poker	15.00			Winter Games	20.00
Swooper	15.00			World Games	20.00
				Xevious	20.00



Please make cheques payable to: Systems Architects Ltd. We also accept Access and Visa. Prices subject to availability. See Amiga Listing for Prices of ST Infocom Adventures. Products not listed please phone for prices. All prices include VAT and delivery in the UK. Callers are welcome to order through the shop. Allow up to 28 days delivery, items usually despatched within 10 days.

SYSTEMS ARCHITECTS

Systems Architects, Dept. PCW1, Syndicate Dept. Store, 6-9 Market Place, Kingston Upon Thames, Surrey KT1 4BR. Tel: 01-549 3028 (24-hr ansaphone)

See us at
the PCW Show in
the Commodore Village

AMIGA A500

£473 inc. VAT

Modulator & Deluxe Paint

ATARI ST £275

SOFTWARE SPECIALS

Impact	11.50
Terrapods	18.50
Flight Simulator II	35.00
Defender of The Crown	22.00
Pintos	11.50
Gold Runner	18.50

AMIGA ONLY

Fairy Tale Adventure	37.50
----------------------	-------

ST ONLY

Barbarian (Palace)	11.50
Tai-Tan	15.00
F15 Strike Eagle	18.50
Indiana Jones	15.00

Above prices apply to mail order only with the exception of software specials and hardware prices. Subject to availability.



SIMTECH



HARDWARE

520 STFM	£269.95
1040 STF	£469.95
1040 STF + Mono Monitor	£569.95
SH204 20Mb Hard Disc	£569.95
Phasor Trinitas Modem	£319.95
Atari Colour Monitor	£369.95
Atari Mono Monitor	£129.95
SMM804 Atari Printer	£189.99
ST Centronics Cable	£10.99
ST Modem Cable	£10.99
Microdeal Clock Card	£29.95
500K Blank Disc (10)	£14.95
1000K Blank Disc (10)	£18.95
Library Box (Capacity 10)	£2.55
Library Box DD40L	£8.49
Rolltop (100 Capcity)	£16.25
Paper (2000 sheets)	£13.25

ART and DESIGN

Degas Elite	£55.95
GFA Draft	£79.95

The Music Studio	£22.95
Pro Sound Designer	£44.95
Pro Sprite Designer	£29.95

BUSINESS and UTILITIES

1st Word Plus	£62.95
Fleet St. Publisher	£92.00
Publishing Partner	£127.50
Haba Writer III	£32.40
ST Easitalk	£29.95
ST Datacomm II	£64.95
Accountant Plus (Sage)	£193.49

GAMES

Airball	£18.99
FSII	£37.95
Silent Service	£18.99
Barbarian	£18.99
Starglider	£18.99
Leader Board	£18.99
Leader Board Tournament	£7.95
Chess (Psion)	£18.99
Gauntlet	£18.99

Arkanoid	£11.49
Star Raiders	£11.49
Xevious	£18.99
Road Runner	£18.99
Pirates Barbary Coast	£9.99
10th Frame Bowling	£18.99
Pinball Factory	£18.99
Crystal Castle	£11.49
Gato	£22.99
SDI	£22.99
Shanghai	£18.99
Strike Force Harrier	£18.99
Arena/Brattaccas	£26.95
Phantasia II	£18.99
TNT	£16.49

ADVENTURES

Alternate Reality	£18.99
Guid of Thieves	£18.99
The Pawn	£18.99
Hitchhikers Guide	£22.99
Hollywood Hijinx	£22.99
Bally Hoo	£22.99

How to order:

By Post to:

118 Doggett Road, Catford,
London SE6 4QB

By Phone:

Call 01-690 3569

All prices include VAT and UK Mainland delivery.

PROGRAMMING: AMSTRAD CPC

◀ continued from page 29

```

600 DATA DD,56,05,DD,4E,00,DD,46,386
610 DATA 02,C5,E5,1A,77,23,13,10,283
620 DATA FA,E1,01,00,08,09,30,04,221
630 DATA 01,50,C0,09,C1,0D,20,E9,2F1
640 DATA C9,DD,6E,02,DD,66,03,DD,439
650 DATA 5E,04,DD,56,05,CB,3C,CB,36C
660 DATA 1D,CD,1D,BC,18,0C,C9,DD,38D
670 DATA 6E,02,DD,66,04,2D,25,CD,2D6
680 DATA 1A,BC,DD,5E,00,DD,56,01,345
690 DATA 7D,12,13,7C,12,C9,C5,E5,3A3
700 DATA 3A,03,95,77,23,13,10,FB,287
710 DATA E1,01,00,08,09,30,04,01,128
720 DATA 50,C0,09,C1,0D,20,E7,C9,3B7
730 DATA CD,58,96,DD,5E,04,DD,56,42D
740 DATA 05,DD,6E,02,DD,66,03,ED,385
750 DATA 53,E4,94,22,E6,94,CD,C0,4F4
760 DATA BB,3A,EB,94,47,DD,2A,E9,4A8
770 DATA 94,CD,B3,96,2A,E6,94,06,454
780 DATA 10,2B,10,FD,ED,5B,E4,94,408
790 DATA CD,C0,BB,21,00,00,11,08,282
800 DATA 00,3A,EB,94,47,19,10,FD,323
810 DATA EB,21,00,00,CD,F9,BB,C9,456
820 DATA DD,6E,00,DD,66,01,7E,32,33F
830 DATA EB,94,23,7E,32,E9,94,23,3EF
840 DATA 7E,32,EA,94,C9,CD,58,96,482
850 DATA 3E,17,CD,5A,BB,3E,03,CD,345
860 DATA 5A,BB,DD,5E,04,DD,56,05,38C
870 DATA DD,6E,02,DD,66,03,ED,53,3D3
880 DATA E4,94,22,E6,94,CD,C0,BB,55C
890 DATA 3A,EB,94,47,DD,2A,E9,94,481
900 DATA CD,B3,96,2A,E6,94,2B,2B,410
910 DATA ED,5B,E4,94,CD,C0,BB,3A,542
920 DATA EB,94,47,DD,2A,E9,94,CD,514
930 DATA B3,96,C9,3E,05,CD,5A,BB,437
940 DATA DD,7E,00,CD,5A,BB,DD,23,43D
950 DATA 10,F1,C9,DD,5E,00,DD,56,43B
960 DATA 01,1A,47,13,1A,6F,13,1A,12B
970 DATA 67,13,7E,C5,E5,CD,DE,96,4E3
980 DATA E1,C1,23,10,F5,C9,CD,A5,505
990 DATA BB,11,EB,94,06,0B,CD,06,32C
1000 DATA B9,7E,F5,CD,09,B9,F1,12,48E
1010 DATA 23,13,10,F2,06,0B,21,EB,252

```

```

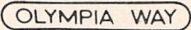
1020 DATA 94,11,F3,94,7E,12,13,12,2E1
1030 DATA 13,23,10,FB,3E,FE,21,F3,38E
1040 DATA 94,CD,AB,BB,3E,FF,21,FB,51D
1050 DATA 94,CD,AB,BB,3E,FE,CD,5A,527
1060 DATA BB,3E,0A,CD,5A,BB,3E,0B,32B
1070 DATA CD,5A,BB,3E,FF,CD,5A,BB,501
1080 DATA 3E,0B,CD,5A,BB,C9,3E,01,333
1090 DATA 32,0C,95,3E,00,32,0D,95,1E5
1100 DATA 3E,17,CD,5A,BB,3E,01,CD,343
1110 DATA 5A,BB,CD,BA,BB,DD,7E,0E,4C0
1120 DATA 32,0E,95,DD,7E,0C,32,0B,276
1130 DATA 95,DD,7E,0A,32,09,95,DD,3A7
1140 DATA 7E,0B,32,0A,95,DD,7E,06,2B8
1150 DATA 32,0B,95,DD,5E,04,DD,56,344
1160 DATA 05,DD,6E,02,DD,66,03,ED,385
1170 DATA 53,04,95,22,06,95,CD,B6,2FC
1180 DATA 9B,CD,9B,97,3A,0D,95,FE,46E
1190 DATA 00,20,07,3E,42,CD,1E,BB,24D
1200 DATA 2B,EF,CD,B6,9B,3E,17,CD,424
1210 DATA 5A,BB,3E,00,CD,5A,BB,C9,3FE
1220 DATA 3A,0B,95,FE,00,2B,07,3E,242
1230 DATA 0B,CD,1E,BB,20,75,3A,09,2B6
1240 DATA 95,FE,00,2B,07,3E,01,CD,2CE
1250 DATA 1E,BB,20,41,3A,0A,95,FE,311
1260 DATA 00,2B,07,3E,00,CD,1E,BB,213
1270 DATA 20,7C,3A,0B,95,FE,00,2B,29C
1280 DATA 0B,3E,02,CD,1E,BB,C2,60,310
1290 DATA 9B,3E,05,CD,1E,BB,20,01,2A6
1300 DATA C9,DD,6E,00,DD,66,01,3A,392
1310 DATA 0C,95,77,32,0D,95,C9,06,2BB
1320 DATA 50,C5,06,FF,10,FE,C1,10,3F9
1330 DATA FB,CD,19,BD,C9,3A,0E,95,441
1340 DATA 47,3A,0C,95,BB,CB,CD,E7,456
1350 DATA 97,CD,B6,9B,ED,5B,04,95,463
1360 DATA 21,60,00,AF,19,22,04,95,204
1370 DATA CD,B6,9B,3A,0C,95,3C,32,334
1380 DATA 0C,95,C9,3A,0C,95,FE,01,344
1390 DATA CB,CD,E7,97,CD,B6,9B,2A,52B
1400 DATA 04,95,11,60,00,AF,ED,52,2FB
1410 DATA 22,04,95,CD,B6,9B,3A,0C,2EC
1420 DATA 95,3D,32,0C,95,C9,3A,0C,2B4
1430 DATA 95,FE,01,CB,CD,E7,97,CD,574

```

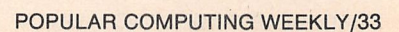
```

1440 DATA B6,9B,2A,06,95,11,10,00,204
1450 DATA AF,19,22,06,95,CD,B6,9B,370
1460 DATA 3A,0C,95,3D,32,0C,95,C9,2B4
1470 DATA 3A,0E,95,47,3A,0C,95,BB,2B7
1480 DATA CB,CD,E7,97,CD,B6,9B,2A,52B
1490 DATA 06,95,11,10,00,AF,ED,52,2AA
1500 DATA 22,06,95,CD,B6,9B,3A,0C,2EE
1510 DATA 95,3C,32,0C,95,C9,ED,5B,3B5
1520 DATA 04,95,2A,06,95,CD,C0,BB,3A6
1530 DATA 3E,05,CD,5A,BB,3E,0F,CD,3BF
1540 DATA 5A,BB,3E,05,CD,5A,BB,3E,37B
1550 DATA BF,CD,5A,BB,3E,05,CD,5A,3DB
1560 DATA BB,3E,BF,CD,5A,BB,3E,05,3AD
1570 DATA CD,5A,BB,3E,BF,CD,5A,BB,491
1580 DATA 3E,05,CD,5A,BB,3E,BF,CD,3BF
1590 DATA 5A,BB,3E,05,CD,5A,BB,3E,37B
1600 DATA BF,CD,5A,BB,3E,05,CD,5A,3DB
1610 DATA BB,3E,BF,CD,5A,BB,3E,05,3AD
1620 DATA CD,5A,BB,3E,BF,CD,5A,BB,491
1630 DATA 3E,05,CD,5A,BB,3E,BF,CD,3BF
1640 DATA 5A,BB,3E,05,CD,5A,BB,3E,37B
1650 DATA BF,CD,5A,BB,C9,DD,7E,00,495
1660 DATA CD,5B,BD,C9,DD,6E,04,DD,4DA
1670 DATA 66,05,DD,56,03,DD,5E,02,2DE
1680 DATA DD,46,01,DD,4E,00,ED,B0,3EC
1690 DATA C9,DD,6E,02,DD,66,03,7E,3DA
1700 DATA 32,5A,99,23,5E,23,56,EB,50A
1710 DATA 22,5B,99,DD,6E,00,DD,66,3A4
1720 DATA 01,22,5D,99,3A,5A,99,47,2BD
1730 DATA 2A,5B,99,11,FB,07,CD,77,372
1740 DATA BC,D2,49,99,2A,5D,99,CD,45D
1750 DATA B3,BC,D2,49,99,CD,7A,BC,4F6
1760 DATA C9,21,5F,99,06,0B,CD,52,312
1770 DATA 99,C9,7E,CD,5A,BB,23,10,3F5
1780 DATA F9,C9,00,00,00,00,00,52,214
1790 DATA 45,41,44,20,45,52,52,4F,222
1800 DATA 52,2E,00,00,00,00,00,00,80
1810 DATA 00,00,00,00,00,00,00,00,0
1820 REM
1830 REM Once pager.bin is saved
1840 REM delete this program.

```

Company	Stand No
Acorn	1303
Activision	1417
Adventuresoft	1100
Amstrad	1403
Anco	3059
Anglo Computers	0316
Arnor	1915
Atari	Atari Village
Babani Publishing	1001
Bubble Bus	1008
Cambridge Computers	1607
Commodore	CBM Village
Compuprint	4002
Computer Bookshops	2212
CRL	3142
Cumana	2026
D & H Games	3096
Digital Integration	1201
Direct Disk	3096
Domark	3035
Durell	3146
Electric Dreams	1317
Electromusic Research	3030
Electronic Arts	1517
Hi-Soft	3077
Kuma	3154
Level 9	3066
Lightwave Leisure	1018
Llamasoft	3093
Martech	3009
Mastertronic	1109
Mattel	3032
Micronet	3143
Microprose	1511
Miracle Technology	4042
Mirrorsoft	1601
Newsfield	3047
Novagen	3062
Ocean	1411
Pace Micro Technology	4026
Piranha	1617
Popular Computing	3021
Precision	4208
RAM Electronics	4015
Robtek	1117
Romantic Robot	1921
Samsung	2010
Sentinel	2116
Software Projects	3140
Superior	3096
Tasman	1916
Trojan	3017
Tynesoft	1722
US Gold	1311
Virgin Games	3096



Blackwolf

J Myatt

Part two of Blackwolf is presented this week. To complete the game you must make it to the door marked IN, while collecting a series of keys for the locked doors, a gun to shoot the ants, an axe for opening a pair of trees, and avoiding the giant ants, the rolling barrels, and the two types of gun posts.

```

700IFX%<2X%=16:PROCC:PROCLEFT1:GOTO960
710IFY%>24Y%=3:PROCC:PROCBACK1:GOTO730
720GOTO650
730Q=11:PROCWAL1:Q=18:PROCWAL1:Q=25:PR
OCWAL1
740P=4:Q=1:PROCH2:P=13:Q=2:PROCR1:FORQ
=3 TO 6:PROCR2:NEXTQ:PROCR3:P=2:Q=6:PRD
CT:P=4:Q=7:PROCT:P=15:Q=4:PROCH2:P=11:Q=
6:PROCT
750IFK4%=0:COLOUR128:COLOUR7:VDU31,12,
8:VDU212
760PROCRE:BE%=0
770PROCIM
780IFK4%=0:IFX%=11ANDY%=8:PROCTING:K4%
=1
790IFX%<SANDBE%=0ST%=1
800IFY%>10:IFST%=0:PROCAN
810ST%=0
820IFX%>16X%=2:PROCC:PROCRIGHT1:GOTO20
0
830IFY%<3:Y%=24:PROCC:PROCFRONT1:GOTO5
90
840IFX%<2X%=16:PROCC:PROCLEFT1:GOTO880
850IFX%>6:IFY%=50RY%=6:0%=470:P%=850:P
ROCL
860IFX%<11:IFY%=20RY%=3:0%=350:P%=945:
PROCL
870DE%=0:GOTO770
880Q=11:PROCWAL2:Q=18:PROCWAL2:Q=25:PR
OCWAL1
890P=2:Q=2:PROCH:P=13:FORQ=1 TO 6:PRO
CR2:NEXTQ:PROCR3:P=5:Q=7:PROCT:P=1:Q=6:P
ROCT
900PROCRE
910PROCIM
920IFX%>16X%=2:PROCC:PROCRIGHT1:GOTO73
0
930IFX%<2:PROCC:X%=16:PROCLEFT1:GOTO22
70
940IFY%<3PROCC:Y%=24:PROCFRONT1:GOTO96

```

```

0
950GOTO910
960P=13:Q=18:PROCR1:FORQ=19 TO 25:PRO
CR2:NEXTQ
970Q=4:PROCWAL1:Q=10:PROCWAL1:P=3:Q=24
:PROCT
980P=4:Q=19:PROCH:P=2:Q=19:PROCT
990IFD9%=0:P=5:Q=13:COLOUR130:PROCDIV
1000P=14:Q=12:PROCH
1010P=4:Q=11:PROCH:N=1085:FORM=478 TO
680STEP32:PROCRIV1:NEXTM
1020PROCRE:J%=20:ST%=0:BE%=0
1030PROCIM
1040IFK9%=1:IFD9%=0:IFX%=6ANDY%>10:PRO
CTING:D9%=1:VDU4:COLOUR128:FORT=14 TO 18
:VDU31,5,T:VDU32:NEXTT
1050IFY%>24Y%=3:PROCC:PROCBACK1:GOTO880
1060IFX%<2:X%=16:PROCC:PROCLEFT1:GOTO21
80
1070IFX%>16:PROCC:X%=2:PROCRIGHT1:GOTO5
90
1080IFX%<SANDBE%=0ST%=1
1090IFY%<9:IFST%=0:PROCAN
1100IFY%>7PROCBAR
1110DE%=0:GOTO1030
1120Q=11:PROCWAL2:Q=18:PROCWAL1:Q=25:PR
OCWAL1:P=1:FORQ=1 TO 6:PROCR2:NEXTQ:PRO
CR3:P=3:Q=2:PROCH2:P=14:Q=5:PROCH2:P=15:
Q=1:PROCH:P=16:Q=6:PROCT:P=15:Q=19:PROCH
2
1130P=6:Q=13:PROCT
1140PROCRE
1150PROCIM
1160IFX%>7:IFY%=60RY%=7:0%=420:P%=815:P
ROCL
1170IFX%<12:IFY%=30RY%=4:0%=320:P%=910:
PROCL
1180IFX%<2X%=16:PROCC:PROCLEFT1:GOTO60
1190IFY%<3Y%=24:PROCC:PROCFRONT1:GOTO12
20
1200IFX%>16PROCC:X%=2:PROCRIGHT1:GOTO13
60
1210GOTO1150
1220IFD2%=0:COLOUR128:P=3:Q=14:PROCDIV
1230P=1:Q=20:PROCR1:FORQ=21 TO 25:PRO
CR2:NEXTQ:Q=4:PROCWAL1:Q=10:PROCWAL1:P=2:
Q=12:PROCH
1240P=5:PROCT:P=15:Q=25:PROCT:P=13:Q=22
:PROCT:P=16:Q=19:PROCH2
1250P=15:Q=13:PROCH:P=9:Q=12:PROCT:P=13
:Q=14:PROCT:P=14:Q=17:PROCT
1260PROCRE:BE%=0
1270PROCIM
1280IFX%>7:IFY%=200RY%=21:0%=530:P%=370
:PROCL
1290IFX%<SANDBE%=0:ST%=1
1300IFY%<9:IFST%=0:PROCAN

```

```

1310IFY%>24Y%=3:PROCC:PROCBACK1:GOTO112
0
1320IFX%<2X%=16:PROCC:PROCLEFT1:GOTO310
1330IFD2%=0:IFX%=4:IFK2%=1:PROCTING:D2%
=1:VDU4:COLOUR128:FORT=15 TO 19:VDU31,3
,T:VDU32:NEXTT
1340IFX%>16X%=2:PROCC:PROCRIGHT1:GOTO14
60
1350ST%=0:GOTO1270
1360P=1:Q=16:PROCR1:P=13:PROCR1:FORQ=17
TO 24:P=1:PROCR2:P=13:PROCR2:NEXTQ:PRO
CR3:P=1:PROCR3:Q=11:PROCWAL1
1370IFD6%=0:COLOUR130:Q=18:PROCDIV
1380P=7:Q=22:PROCT:P=11:PROCT:P=9:Q=25:
PROCT:P=15:Q=12:PROCH2
1390IFK7%=0:COLOUR128:COLOUR1:VDU31,9,2
3:VDU212
1400PROCRE
1410PROCIM
1420IFX%<2X%=16:PROCC:PROCLEFT1:GOTO112
0
1430IFK6%=1:IFD6%=0:IFY%=17:PROCTING:Q=
18:PROCDIV:D6%=1
1440IFK7%=0:IFY%=23:PROCTING:K7%=1
1450GOTO1410
1460Q=4:PROCWAL2:Q=10:PROCWAL1:P=15:Q=5
:PROCH2:P=1:Q=13:PROCR1:FORQ=14 TO 23:P
ROCR2:NEXTQ:PROCR3:P=13:Q=13:PROCH:P=16:
Q=12:PROCT
1470IFD8%=0:COLOUR130:Q=14:PROCDIV
1480IFK9%=0:COLOUR128:COLOUR2:VDU31,8,2
1:VDU212
1490P=13:Q=17:PROCR1:FORQ=18 TO 23:PRO
CR2:NEXTQ:PROCR3:P=8:Q=22:PROCH:P=11:Q=2
4:PROCT
1500IFK1%=0:VDU31,15,12:COLOUR1:VDU212
1510PROCRE
1520PROCIM
1530IFX%>7:IFY%=60RY%=7:0%=500:P%=820:P
ROCL
1540IFD8%=0:IFK8%=1:IFY%=13:PROCTING:Q=
14:PROCDIV:D8%=1
1550IFK9%=0:IFX%=7ANDY%=21:PROCTING:K9%
=1
1560IFX%<2X%=16:PROCC:PROCLEFT1:GOTO122
0
1570IFK1%=0:IFX%=14:IFY%=12:PROCTING:K1
%=1
1580IFY%<3:Y%=24:PROCC:PROCFRONT1:GOTO1
980
1590GOTO1520
1600P=4:Q=22:PROCH:Q=11:PROCH:P=13:Q=22
:PROCH:Q=11:PROCH:P=3:Q=18:PROCH2:P=15:Q
=15:PROCH2
1610FORM=350 TO 600STEP32:N=330:PROCRI
V1:N=840:PROCRIV1:NEXTM

```


PCW SHOW...new products...new prices

See us at the show
...Stand no 3029

All prices VAT & delivery inclusive

For Commodore

Dynamic Duo

Excelerator+ & GEOS

WHAT A BUNDLE! The critically praised Excelerator+ disk drive is now being offered with the super sophisticated GEOS (Graphic Environment Operating System) absolutely **FREE** (normally £49.95).

Excelerator+ & GEOS OFFER...£159.95

Also available as above but with the Freeze Machine backup cartridge for £179.95

Slimline 64 replacement case

Make your old '64 look like a smart new 64C with this simple to fit quality product.

ONLY £19.95

'64 Circuit Board...Complete, brand new, use for spare, repair or upgrade a Vic-20. Limited quantity...**ONLY £45.00**



The Excelerator+ & GEOS pictured with a '64 installed in a Slimline case

For PCs

32 MEG HARDCARD

PRICE DESTRUCTION!

Western
Digital
Filecard

Only
£319.00
INC VAT & DELIVERY

A staggering offer on top brand equipment, due to our purchasing commitment we can offer this product at *below* trade price!! We even supply it ready tested and configured, all you have to do is slot it in and start using it (please specify 1512, 1640 or other).

- Simple fitting
- Low power consumption
- Superb quality
- Full year warranty
- Suits SD or DD PCs

STOP PRESS
"XTREE" file management software included **FREE**. This normally retails for £50.00

21 MEG HARDCARD

Western Digital 21MEG Filecard
Same features as 32MEG above **£269.00**

COPY II PC

Central Point Software's popular & powerful disk backup program. Also transfers many popular programs to hard disk, latest version **£34.95**

COPY II OPTION BOARD

Make backups of ANY software (other than protection by physical damage) using this expansion card. **£79.95**

PC TOOLS

Central Point Software's disk utility package, combines best features of Norton, Fastback & Disk Optimizer at an ultra-low price **£34.95**

MEMORY UPGRADE

Upgrade 1512 memory to 640K, full instructions **£19.95**

TAPE STREAMER

Cipher 1525-CT, 25 MEG capacity for Amstrad **£469.00**

NEC V30

Replaces 8086, improves operating speed **£24.95**

8087-2 MATHS CO-PROCESSOR

8MHz, improves calculation speeds **£159.00**

2MEG "EMS"

Fully loaded Zucker 2MEG RAM board **£299.00**

MODEM CARD

Amstrad's PC modem, Inc Microlink membership **£158.00**

1512/1640 PRICE CHECK

Choose an Amstrad PC from our vast range. We offer outstanding value with our Evesham upgraded models. The single drive versions are professional internal installations leaving maximum room possible for future expansion, the double drive versions use a hardcard. All systems are supplied fully configured, ready for operation. Service contracts arranged. 1512 models can be supplied with 640K RAM upgrade installed for £20.00 extra.
(Figures in light type are ex VAT prices)

STOP PRESS FREE with 1512... Migent Ability & 4 games
(former retail value over £200.00)

	SD	DD	AMS 20MEG	SD 21MEG	DD 21MEG	SD 32MEG	DD 32MEG
MONO 1512	381.74 439.00	477.39 549.00	N/A N/A	598.26 688.00	693.91 798.00	641.74 738.00	737.39 848.00
COLOUR 1512	520.87 599.00	616.52 709.00	N/A N/A	737.39 848.00	833.04 958.00	780.87 898.00	876.52 1008.00
MONO 1640	494.78 569.00	581.74 669.00	868.70 999.00	711.30 818.00	798.26 918.00	754.78 868.00	841.74 968.00
CGA 1640	625.22 719.00	712.17 819.00	912.17 1049.00	841.74 968.00	928.69 1068.00	885.22 1018.00	972.17 1118.00
EGA 1640	755.65 869.00	842.61 969.00	1129.57 1299.00	972.17 1118.00	1059.13 1218.00	1015.65 1168.00	1102.61 1268.00

Make the right decision
with a

star

All printer prices include
• VAT
• INSURED DELIVERY
• PRINTER CABLE

printer from Evesham Micros

We use and recommend Star printers, they offer the best combination of features, print quality, reliability and value for money.

- Star **NL-10** New low price (inc. cartridge, state type) **£219.00**
- ... 2 extra ribbons (value £13.90) **FREE** with NL-10 orders...
- Star **NX-15** Wide carriage version of **NL-10** **£319.00**
- Star **ND-15** Faster version of **NX-15** **£419.00**
- Star **NR-15** 240cps, 60 NLQ wide carriage **£499.00**
- Star **NB24-10** Brilliant 24 pin printer 216cps, 72cps NLQ **£479.00**
- Star **NB24-15** Wide carriage 24 pin **£599.00**
- Star **NB-15** Ultimate 24 pin, 100cps in NLQ! **£719.00**
- Star **SF10-D** Sheet feeder, all 10" models **£59.00**
- Star **SF15-D** Sheet feeder for NX, ND & NR15 **£159.00**
- Star **SF15-B** Sheet feeder for NB15 & 24-15 **£199.00**
- PANASONIC KXP-1081 Best sub £200.00 model **£179.00**
- Micro P. MP165 Fast & popular **£219.00**
- Micro P. MP200 Very fast printer for the money **£299.00**
- Micro P. MP26 Excellent 26cps d'wheel great value **£249.00**
- Micro P. MP40 Yes a 40cps d'wheel for this price **£349.00**
- Amstrad DMP3160 New version now 160cps **£189.00**

PRINTERS

Prices include VAT/delivery. Next day delivery £5.00 extra

How to order

Send cheque P.O. or ACCESS/VISA details
By phone with ACCESS/VISA
Govt., Educational or PLC orders welcome
Same day despatch whenever possible
Callers welcome, open 6 days 9.30-5.30
All goods subject to availability E.&O.E.
Telex: 333294 Fax: 0386 765354

Evesham Micros
63 BRIDGE STREET
EVESHAM
WORCS WR11 4SF
Tel: 0386 765500

Also at: 1756 Pershore Rd., Cotteridge, Birmingham, B30 3BH Tel: 021 458 4564

**Evesham
Micros**

PROGRAMMING: BBC

```

1620IFD3%=0:P=17:Q=3:COLOUR129:PROCDIV
1630Q=4:PROCWAL1:Q=10:PROCWAL2:P=2:Q=6:
PROCT:IFK2%=0:COLOUR7:VDU31,4,7:VDU212
1640PROCCE:J%=11
1650PROCIM
1660IFX%<11:IFY%=190RY%=20:Q%=320:P%=39
5:PROCL
1670IFX%>7:IFY%=160RY%=17:Q%=420:P%=495
:PROCL
1680IFK3%=1:IFX%=15:IFD3%=0:PROCTING:VD
U4:COLOUR128:FORQ=5 TO 7:VDU31,17,T:VDU
32:NEXTT:D3%=1
1690IFY%>24:PROCC:Y%=3:PROCBACK1:GOTO31
0
1700IFX%>16:X%=2:PROCC:PROCRIGHT1:GOTO1
860
1710IFK2%=0:IFX%=5:VDU4:COLOUR128:VDU31
,4,7:VDU32:PROCTING:K2%=1
1720PROCBAR
1730DE%=0:GOTO1650
1740Q=4:PROCWAL2:Q=10:PROCWAL2:P=1:Q=12
:PROCR1:FORQ=13 TO 20:PROCR2:NEXTQ:PROCR
3:Q=25:PROCWAL1
1750IFAXED%=0:P=8:Q=10:PROCT:P=10:PROCT
1760P=1:Q=7:PROCT:P=17:PROCT:IFK3%=0:CO
LOUR128:COLOUR1:VDU31,16,7:VDU212
1770P=13:Q=12:PROCR1:FORQ=13 TO 20:PRO
CR2:NEXTQ:PROCR3
1780IFK5%=0:COLOUR128:COLOUR1:VDU31,7,2
2:VDU212
1790PROCCE
1800PROCIM
1810IFK5%=0:IFX%=7:IFY%=22:PROCTING:K5%
=1
1820IFY%<3:Y%=24:PROCC:PROCFRONT1:GOTO8
0
1830IFK3%=0:IFX%=15ANDY%=7:PROCTING:K3%
=1
1840IFY%=8:IFAXE%=1:IFAXED%=0:PROCTING:
VDU4:COLOUR128:VDU31,8,9:VDU32:VDU32:VDU
32:VDU32:VDU31,8,10:VDU32:VDU32:VDU32:VD
U32:AXED%=1:S%=5%+30
1850GOTO1800
1860Q=4:PROCWAL1:Q=10:PROCWAL2:J%=13:P=
13:Q=12:PROCR1:FORQ=13 TO 23:PROCR2:NEX
TQ:PROCR3:P=4:Q=12:PROCH
1870P=7:Q=22:PROCH:P=10:Q=25:PROCT:P=15
:Q=14:PROCH2
1880P=17:Q=7:PROCT:N=250:FORM=290 TO 5
60STEP32:PROCRIV1:NEXTM:P=3:Q=21:PROCH
1890IFAXE%=0:COLOUR128:COLOUR1:VDU31,11
,23:VDU216
1900IFD4%=0:COLOUR128:Q=9:PROCDIV
1910PROCCE
1920PROCIM
1930IFAXE%=0:IFY%=23:PROCTING:AXE%=1

```

```

1940IFD4%=0:IFK4%=1:IFY%=8:Q=9:PROCTING
:PROCDIV:D4%=1
1950PROCBAR
1960IFX%<2:PROCC:X%=16:PROCLEFT1:GOTO16
00
1970DE%=0:GOTO1920
1980Q=4:PROCWAL1:Q=6:P=1:PROCR1:P=13:PR
OCR1:FORQ=7 TO 19:PROCR2:NEXTQ:PROCR3:P
=1:FORQ=7 TO 19:PROCR2:NEXTQ:PROCR3:J%=
15
1990IFD5%=0:COLOUR129:Q=12:PROCDIV
2000P=7:Q=7:PROCT:P=11:PROCT:IFK6%=0:CO
LOUR2:VDU31,9,5:VDU212
2010Q=24:PROCWAL2:PROCCRE
2020PROCIM
2030IFD5%=0:IFK5%=1:IFY%=14:PROCTING:Q=
12:PROCDIV:D5%=1
2040IFY%>24:Y%=3:PROCC:PROCBACK1:GOTO14
60
2050PROCBAR
2060IFK6%=0:IFY%=6:PROCTING:K6%=1
2070DE%=0:GOTO2020
2080Q=24:PROCWAL2:Q=4:PROCWAL1:Q=10:PRO
CWAL1:FORM=350 TO 650STEP32:N=220:PROCR
IV1:N=1100:PROCRIV1:NEXTM
2090P=13:Q=18:PROCH2:SK%=19
2100P=12:Q=15:PROCT:P=14:Q=12:PROCH:P=5
:Q=13:PROCT:COLOUR1:VDU31,3,5:VDU187:VDU
188:VDU31,3,6:VDU186:VDU189
2110IFK8%=0:COLOUR128:COLOUR2:VDU31,16,
21:VDU212
2120PROCCE
2130PROCIM
2140IFY%>24:Y%=3:PROCC:PROCBACK1:GOTO44
0
2150IFK8%=0:IFX%=15:IFY%=21:PROCTING:K8
%=1
2160PROCSDH
2170DE%=0:GOTO2130
2180Q=4:PROCWAL1:Q=10:PROCWAL1:Q=25:PRO
CWAL1:P=2:Q=7:PROCT:P=13:Q=18:PROCR1:FOR
Q=19 TO 24:PROCR2:NEXTQ:PROCR3
2190P=14:Q=17:PROCT:P=11:Q=14:PROCH:P=2
:Q=12:PROCH:N=220:FORM=290 TO 550STEP32
:PROCRIV1:NEXTM:P=7:Q=13:PROCH:P=2:Q=23:
PROCH
2200IFK10%=0:COLOUR128:COLOUR2:VDU31,5,
20:VDU212
2210P=8:Q=20:PROCT:P=6:Q=19:PROCT
2220PROCCE
2230PROCIM
2240IFK10%=0:IFX%=5:IFY%=21:PROCTING:K1
0%=1
2250IFX%>16:X%=2:PROCC:PROCRIGHT1:GOTO9
60
2260GOTO2230

```

```

2270M=950:FORM=230 TO 1000STEP40:PROCR
IV1:NEXTM:Q=11:PROCWAL2:Q=25:PROCWAL1:Q=
18:PROCWAL2:P=2:Q=2:PROCH:Q=5:PROCH:P=15
:PROCH:Q=2:PROCH
2280P=12:Q=13:PROCT:P=13:Q=15:PROCT:P=1
:Q=13:PROCR1:FORQ=14 TO 20:PROCR2:NEXTQ
:PROCR3
2290J%=17:IFD10%=0:COLOUR130:Q=10:PROCD
IV
2300COLOUR1:COLOUR135:VDU31,9,4:VDU217:
VDU218:VDU31,9,5:VDU219:VDU220:COLOUR7:CO
LOUR130:VDU31,3,16:VDU207:VDU208:VDU31,
3,17:VDU209:VDU210
2310P=7:Q=7:PROCT:P=11:PROCT
2320PROCCE
2330PROCIM
2340IFX%>16:X%=2:PROCC:PROCRIGHT1:GOTO8
80
2350IFY%=7:PROCF
2360PROCBAR
2370IFY%=12:IFD10%=0:IFK10%=1:PROCTING:
Q=10:PROCDIV:D10%=1
2380DE%=0:GOTO2330
2390DEFFROCIM
2400COLOUR128
2410IFINKEY(-73)ANDINKEY(-105):GOTO2520
2420IFFR%=0ANDINKEY(-73)IFW%=0:Y%=Y%-1:
PROCFRONT1:LF%=0:FO%=1:RG%=0:BG%=0:GOTO2
440
2430IFFR%=0ANDINKEY(-73)IFW%=1:Y%=Y%-1:
PROCFRONT2:FO%=1:BG%=0:RG%=0
2440IFBK%=0:IFINKEY(-105)IFW%=0:Y%=Y%+1
:PROCBACK1:LF%=0:FO%=2:FR%=0:RG%=0:GOTO2
490
2450IFBK%=0:IFINKEY(-105)IFW%=1:Y%=Y%+1
:PROCBACK2:FO%=2:FR%=0:RG%=0
2460IFRG%=0ANDINKEY(-67)IFW%=1:X%=X%+1:
PROCRIGHT2:LF%=0:BG%=0:FO%=3:FR%=0:GOTO2
490
2470IFRG%=0ANDINKEY(-67)IFW%=0:X%=X%+1:
PROCRIGHT1:FO%=3:FR%=0:BG%=0:LF%=0
2480IFLF%=0ANDINKEY(-98)IFW%=1:X%=X%-1:
PROCLEFT2:RG%=0:BG%=0:FO%=4:FR%=0:GOTO26
00
2490IFLF%=0ANDINKEY(-98)IFW%=0:X%=X%-1:
PROCLEFT1:FO%=4:FR%=0:RG%=0
2500IFINKEY(-73)ANDINKEY(-67):FO%=5
2510IFGJ%=0ENDPROC
2520IFFO%=1ANDINKEY(-74)F1%=1
2530IFF1%=1:PROCFIU
2540IFFO%=2ANDINKEY(-74)F1%=2
2550IFF1%=2:PROCFID
2560IFFO%=4ANDINKEY(-74)F1%=4
2570IFF1%=4:PROCFIL
2580IFFO%=3ANDINKEY(-74)F1%=3
2590IFF1%=3:PROCFIR

```




The leading North West
Specialist ATARI Dealer



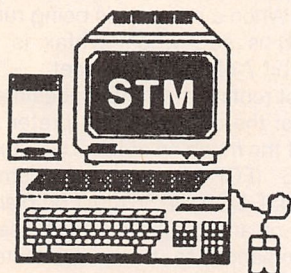
**ADBROKE
COMPUTING**
INTERNATIONAL

33, Ormskirk Road
Preston, Lancs.
Tel: (0772) 21474
Mail Order: 27236 or
Bul/Board 6pm to 9am

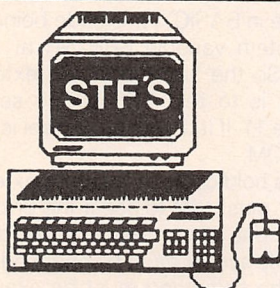


This Company has given years of full support to ATARI users Countrywide from their retail shop premises at Ormskirk Road, Preston. Now from their NEW Mail Order Depot they can offer the same Excellent service to all Mail Order Customers.

All Software and Hardware is fully tested prior to selling. This ensures Customers receive working items so that returned goods, and all the attendant frustration are a thing of the past. All Hardware is supported by our own 'ON SITE' engineers, therefore quick turn round on all repairs is Guaranteed. All prices quoted are fully VAT inc. and there are no 'hidden extras', what you see is what you get. Prices include delivery. Items despatched same day. Ring for latest price changes.



520STM Packages.....PHONE



1040STF+Mouse
+Softwr.....£480.00
1040STF+Mouse
+Hi-Res Mon
+Softwr.....£580.00
1040STF+Mouse
+Colour Mon
+Softwr.....£780.00

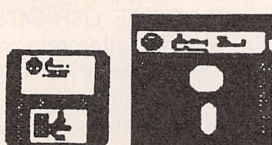
1Meg Upgrades are available for the 520STM. These are our own design and are very simple to fit. Using the same board, all ST's can be Upgraded to 2mg or 4mg. So no need to sell your 520 just Upgrade to a Mega ST using our board.

1Meg Upgrade (STFM).....£70.00
1Meg Upgrade (All ST's).....£135.00
2.5Meg Upgrade +Board.....PHONE
4Meg Upgrade +Board.....PHONE

If any of the above Upgrades are purchased with Hardware then deduct £5 from total.

PRINTERS

Dot Matrix
Star NL10.....£240.00
NL10 Sheetfeeder.....£55.00
National Panasonic.....PHONE
MP165.....PHONE
MP135.....PHONE
LX86 Tractor Feed.....£19.00
LX86 Sheetfeeder.....£55.00
LQ800 24pin D/M.....£525.00
All Others.....PHONE



3 1/2 D/S	5 1/4 D/S
D/D	D/D 46TPI
Per Disk£0.80
10 Disks£6.50
10 Disks+Plastic	
lib case ...£17.50£7.50
100 Disks +Cases .£150.00£60.00
500 Disks +Cases .£650.00£280.00

All Disks are covered by an unconditional lifetime guarantee.



We also stock a full range of quality P/D ST Software at £3.99 per Disk Send SAE for catalogue.



Our ATARI trained engineers will repair all Hardware in minimum time at competitive rates. Please ring for a quotation. All repairs carry a 90 day warranty.

NEWLY IMPORTED

Imager. Easily fixed to your printer it will digitise anything placed in the printer and save to Disk to be used with Dega, Elite etc. RRP £99.99.

All Printers, Disk Drives etc supplied with cables etc. NO HIDDEN EXTRAS

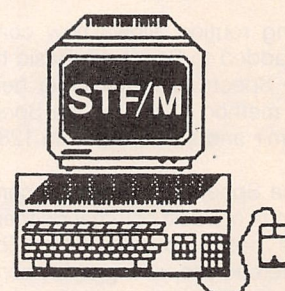
Mega ST'sPHONE
Lazer PrintersPHONE
PC ClonesPHONE

DUST COVERS

Computers.....£3.99
Monitors.....£4.99
Disk Drives.....£2.99
Printers.....£7.99

IF IT'S AVAILABLE we have it!
Send SAE for full catalogue.

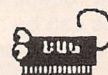
All Dedicated books and mags in stock



520STFM+Mouse
+Softwr.....£285.00
520STFM+Mouse
+Softwr
+1Meg Upgrade.....£350.00
520STFM Mega Pack
520STFM+Mouse
+Softwr
+1Meg Upgrade
+1Meg 2nd Drive.....£485.00
Equal to 1040STF+1/2Meg Drive
+Modulator

For Med Res Col Mon add.....£299.00
For High Res Mono Mon add....£129.00

All Hardware is covered for 12 months by our service dept. and is tested prior to delivery to assure satisfaction.



We have a complete range of Software in stock and fully tested.

We also stock a full range of ATARI 8Bit Hardware and Software including the new XE range. Please ring for prices

PERIPHERALS

Triangle 1mg D/Drive.....£139.00
Triangle 2x1mg D/Drive.....£229.00
Pro Draw Graphics Tab'.....£310.00
Cumana 1Meg D/Drive £139.00
All Drives come complete with Software

HARD DRIVES

Atari 20mg.....£550.00
Triangle 20mg Hard Disk.....£669.00
Supra 20mg.....£550.00
30mg.....PHONE
60mg.....PHONE

Any Software problems? Queries? give us a ring we usually have the answer

TO ORDER Simply send, or phone your order, stating Full Name, Address, Visa or Access Nos, Cheque or Money order. Make payable to Ladbroke Computing International, 33, Ormskirk Road, Preston, Lancs. PR1 2QP.

FOR MORE INFO CALL ON THE ABOVE NUMBERS OR SEND SAE AND STATE FULL REQUIREMENTS

Phoenix

Ian Wooff

Over the next three weeks Ian Wooff explains how to customise Basic and provides very useful examples.

Part 1 - Adding commands to Basic

The following routine allows new commands to be added to Spectrum Basic by extending the Spectrum's interpreter held in ROM. This method works on the Spectrum, Spectrum+ and should work on 128K versions.

Although the Spectrum provides a comprehensive range of Basic commands there is always the desire to add more. The possibilities are endless, new graphic commands, commands to produce white noise, and toolkit commands soon.

There are two different ways of adding new commands to basic. The first is to reuse the tokens which are already in use. For example, the CLS command might become CLS LENGTH, HEIGHT which would clear the given area of the screen. These new commands must fail the normal syntax checking in ROM.

The second method is to create new keywords, such as *RENUM or *FILL. The '*' is needed to get out of 'K' cursor mode. The star could be replaced by a dot, a question mark, or one of a variety of characters.

This article adopts the second method as although the definitions take more memory, it can be seen at a glance what they do.

The following routine demonstrates how new commands can be added to Basic, by adding a command to draw a box.

```
*BOX X-Coordinate,Y-Coordinate,BOX
HEIGHT,BOX LENGTH
```

The X and Y co-ordinates point to the bottom lefthand corner of the box, the HEIGHT and LENGTH specifying the dimensions of the box in pixels.

Listing One is a Basic program which enters the extended interpreter into memory before saving it to tape. The extended interpreter recognises, checks the syntax, and executes the new commands, when they are used.

To use the new command enter listing one and run it. Once the code has been saved to tape type NEW <ENTER>, then enter and run listing two, to test the new command.

Any program which uses the extended interpreter must begin with the command 'RANDOMISE USR 64756' to turn the extended interpreter on. The commands CLEAR and NEW turn the extended interpreter off and so the above command must be used to turn it back on.

The new commands can be entered in either upper or lower case or a mixture of both. Spaces and colour codes can be added in the command at the user's will.

If the computer accepts a line containing a new command but produces the error report "Nonsense in BASIC", when the line is run then place a space in front of the new command. It is up to you to 'pad out' to new commands with spaces, if desired.

If the computer refuses to accept a line containing a new command it is probably because the extended interpreter is not turned on. To solve this place a REM command at the start of the line and the line will now be accepted by the computer. Then enter the following as a direct command, RANDOMISE USR 64756. This will turn the extended interpreter on. The REM command can now be removed from the line and the computer should accept the line, if the problem was caused by the extended interpreter being off.

The extended interpreter allows the new commands to have any form of parameters, numbers, functions, basic variables, strings etc. In short, if it's acceptable to the interpreter in ROM it is acceptable to the extended interpreter.

You may wish to alter the first character of the new command to something other than a star. To do this simply poke 64818 with its code, ie, POKE 64818, CODE "I". The new character should remove the 'K' cursor mode.

Listing Three is disassembly of the code and shows how you can add further commands of your own.

As mentioned above the method of adding new commands is to extend the Spectrum's interpreter to include your own new commands. When the interpreter in ROM comes across something that it does not allow or understand it produces one of those irritating but useful error messages.

If we can get control before an error message is produced we could test to see if the error was caused by one of our new commands, and if so, deal with it.

To see if this is possible we need to look at what the Spectrum does with an error.

- 1) The address reached by the interpreter is copied into the error pointer X PTR.
- 2) The error code is put in ERR NR.
- 3) The stack pointer is loaded from ERR SP, so it points to the item at the bottom of the machine stack.
- 4) The calculator stack is cleared.
- 5) The machine code instruction RET removes the bottom item from the stack and control is given to this address.

At runtime the address removed by the RET instruction is 4867 (1303H). This halts the program and the correct error message is produced. During syntax checking this address is 4791 (12B7H), and causes the line to be displayed with a flashing cursor at the position which caused the error.

By placing the start address of our extended interpreter at the bottom of the machine stack control will be given to it when an error occurs. This seems fine, but where is the bottom of the machine stack?

The address of the bottom of the machine stack is held in the system variables at 23613/4 (5C3D/EH), and is known as ERR SP.

So all we need to do is to substitute the bottom of the machine stack, the address held in ERR SP, with the address of our extended interpreter. When an error occurs the stack pointer is loaded from ERR SP and control is transferred to our extended interpreter using the RET instruction. This seems fine, but how do we know whether the program is being run and so the command needs executing, or is just having its syntax checked?

Here the system variables come to the rescue again. This time it is FLAGS at 23611 (5C36H). When a program is being run bit 7 of FLAGS is set, when syntax is being checked bit 7 of FLAGS is reset.

The first routine at 64756 places the start address of the extended interpreter at the bottom of the machine stack. This routine is at 64756 (FCF4H), and so command RANDOMISE USR 64756 must be placed at the start of any program which uses the new commands to bring the extended interpreter into action.

During both syntax checking and runtime any new command will have error code 11 "Nonsense in BASIC", this code being held in the system variable ERR NR at 23610 (5C3AH). So the first job of our extended interpreter is to test ERR NR to see if it holds code 11. If it does not, control is given back to ROM.

If it does hold code 11 then the extended interpreter must test to see if the error was caused by one of our new commands. If it was, then its syntax must be checked and if required the command must be executed. To do this the extended interpreter uses three tables.

The first table used by the extended interpreter is the Command Table. This holds the command format data for all the new commands. Each entry in this table takes the form,

Command length, Command, parameter value (eg, 3, "BOX", 0)

The three represents the length of the new command, "BOX", and the zero is the parameter value. The table must be ended with a byte which has bit 7 set. If in doubt add 128 (80H), to the end of the table.

The second table is the Parameter Table which holds the possible parameters which new commands may have. Multiple parameters are separated by commas.

PARAMETER	PARAMETER VALUE
Four numbers	0
Three numbers	2
Two numbers	4
One number	6
No parameters	8
One string	10
Two strings	12
One number and one string	14

It is possible to add new parameter formats such as three strings. To do this create a routine to check for three strings separated by commas, and add it to the extended interpreter. For example:

PROGRAMMING: SPECTRUM

call 7298 ;ROM routine to evaluate a string 1C8CH
call COMMA ;ex. interpreter routine test for a comma FDDAH
jp STR2 ;ex. interpreter routine evaluate 2 strings FD7BH

Add the address of this routine to the end of the Parameter Table and the new parameter value becomes 2 plus the last parameter value. Using this method any combination of parameters is possible for your new commands.

The third table is the Address Table. This holds the addresses of the routines which execute the commands during runtime. The values in this table must be in the same order as the values in the Command Table.

The extended interpreter is able to handle 255 new commands. This value could easily be increased to 65535 new commands, the only problem being that of memory which sets a practical limit of less

than 1000 new commands.

Some important points to bear in mind when adding your own new commands are:

1) The parameters are placed on the calculator stack in the reverse order to how they appear in the command. Use the extended interpreter routines GETBC and GETA to get and 8 bit or 16 bit numbers off the top of the calculator stack. Strings have a string descriptor placed on the stack. To find the address and length of the string use CALL 11249 (2BF1H). On return A equals one for a complete string, ie, old copy of string to be deleted, or zero if the string comes from an array of strings or is a 'slice' of a string. BC is set to the length of the string and DE is set to the start address.

2) The registers IY and HL' must be set correctly as a return to Basic is being made. IY must always be 23610 (5C3AH), and HL' must be 10072 (2758H) on returning

3) The routines which execute the new

commands must be ended by a jump to the extended interpreter routine RET at 65197 (FEADH).

4) Two commands with the same name but different parameters are not allowed. For example, *MOVE 10,10 and *MOVE "SHIP","LAND".

5) New commands which are the same as Sinclair commands are allowed. For example *PAUSE 100 and PAUSE 100 (Sinclair command 'M' key).

6) The letters making up new commands in the Command Table **must** be entered in upper case otherwise they will not be recognised by the extended interpreter.

7) If you wish to use a different separator to a comma then duplicate the routine COMMA 64986 (FDDAH), replacing the CP "," with the desired character. The parameter routine will also need rewriting/amending to accept the new separator.

```
1 DEF FN h(a$)=FN b(a$(1))*16+FN b(a$(2))
2 DEF FN b(a$)=CODE a$-48-7*(a$)"9"
10 CLEAR 64755
20 FOR a=64756 TO 65143 STEP 8
30 READ r$,r
40 PRINT a;"-";r$;"=";r
50 LET c=0
60 FOR g=0 TO 7: LET z=FN h(r$): LET r$=r$(3 TO )
70 POKE a+g,z
80 LET c=c+z: NEXT g
90 IF c>0 THEN PRINT "ERROR IN LINE";1000+((a-64756)*1.25): STOP
100 NEXT a
110 SAVE "EX. BASIC1"CODE 64756,388
1000 DATA "2A3D5C01FEFC7123",850
1010 DATA "70C93A3A5CFE0B28",826
1020 DATA "21FDCB017E200721",688
1030 DATA "FEFCE5C3B712CD03",1339
1040 DATA "13FD3600FF2A595C",804
1050 DATA "CDA71121FEFCE5C3",1352
1060 DATA "B412AF3204FE215D",807
1070 DATA "5C35E5DFE1FE2A20",1150
1080 DATA "D034D02119FEDDCB",1217
1090 DATA "007E20C52A5D5CE5",811
1100 DATA "DD4600DFE6DFDD23",1223
```

```
1110 DATA "DDBE00201AE710F4",960
1120 DATA "FD3600FFFD362600",907
1130 DATA "E1DD6E011105FE26",871
1140 DATA "00195E2356EBE948",780
1150 DATA "0C0600DD09E1225D",600
1160 DATA "5C2104FE3418BFCB",855
1170 DATA "8C1CCDD4FDCB8C1C",1217
1180 DATA "181CCDB21C1BF3DF",905
1190 DATA "1814CD7A1CCDDAFD",1075
1200 DATA "CD7A1C1B09CD7A1C",743
1210 DATA "CDDAFDCB21CFDCB",1495
1220 DATA "007E2B4CFD36000B",560
1230 DATA "FE0D2B04FE3A2040",719
1240 DATA "FD3600FFFD36017E",1145
1250 DATA "201221FEFCE521B7",1034
1260 DATA "12E5C3761B21FEFC",1126
1270 DATA "E5C3761B3A04FE87",1020
1280 DATA "6F1115FE18B9FDCB",1020
1290 DATA "007E2B14DFFD3600",716
1300 DATA "0BFE2C200BFD3600",659
1310 DATA "FFE7C9D1FD36000A",1213
1320 DATA "C305FDCDD52D3BF3",1215
1330 DATA "20F1C9CDA22D1BF6",1156
1340 DATA "00BEFD99FD94FD9F",1361
1350 DATA "FD8BFD81FD7BFD86",1537
1360 DATA "FD1FFE000003424F",686
1370 DATA "5B0080CDF7FD3277",1090
```

```
1380 DATA "FECDF7FD3276FECB",1586
1390 DATA "F7FD327E5CCDF7FD",1473
1400 DATA "327D5CAFCB2B2D3A",790
1410 DATA "76FECB6FFE3A77FE",1373
1420 DATA "CD282DAFCB6FFEAF",1210
1430 DATA "CD282D3A76FECB28",965
1440 DATA "2DCD6E34CDB/243A",894
1450 DATA "77FECB2B2DCB6E34",1030
1460 DATA "AFCD6FFE215827D9",1122
1470 DATA "C3C9FDCD282DCB87",1327
1480 DATA "24C9000000000000",237
```

```
10 RANDOMIZE USR 64756
20 BORDER 0: PAPER 0: INK 7: CLS
30 OVER 1: DIM a$(704)
110 FOR a=1 TO 11: FOR d=6 TO 1 STEP -1
120 PRINT AT 0,0; INK d;a$: LET t=(a*7)+d
130 *BOX t,t,175-(2*t),255-(2*t)
140 NEXT d: NEXT a: FOR a=1 TO 35: PRINT AT 0,0; INK RND*7;a$: NEXT a
150 CLS : FOR s=1 TO 6: INK s
160 FOR a=(s-1)*8 TO s*8 STEP 2
170 *BOX a,a,175-(2*a),255-(2*a)
180 NEXT a: NEXT s
190 PAUSE 0: RUN
```

```
** pass 1
** errors 0
** warnings 0
```

*PRINTER ON

```
FCF4= 10 ORG 64756
FCF4 2A3D5C 20 LD HL,(23613); Address of bottom of stack
FCF7 01FEFC LD BC,START; Start of extended interpreter
FCFA 71 LD (HL),C
FCFB 23 INC HL
FCFC 70 LD (HL),B; Place START on bottom of stack
FCFD C9 RET
FCFE 3A3A5C 30 START:LD A,(23610)
FD01 FE0B CP 11; Was error code 11, "Nonsense in BASIC" ?
```


PROGRAMMING: SPECTRUM

FD03 2821	JR	Z,NONSENSE	
FD05 FDCB017E	40 SYNTAX:	BIT	7,(IY+1) ; Bit 7 of FLAGS set at runtime
FD07 2007	JR	NZ,RUNERROR	
FD0B 21FEFC	LD	HL,START ;	Syntax error - Place START
FD0E E5	PUSH	HL ;	on bottom of stack for next error
FD0F C3B712	JP	#12B7 ;	Jump back to ROM
FD12 CD0313	50 RUNERROR:	CALL	#1303 ; Runtime error - Produce error report
FD15 FD3600FF	LD	(IY+0),255 ;	Clear ERR NR
FD19 2A595C	LD	HL,(23641) ;	Remove floating point forms from line in
FD1C CDA711	CALL	#11A7 ;	editing area before doing a syntax check
FD1F 21FEFC	LD	HL,START ;	Place START on bottom of
FD22 E5	PUSH	HL ;	stack for next error
FD23 C3B412	JP	#12B4 ;	Jump back to ROM
FD26 AF	60 NONSENSE:	XOR	A
FD27 3204FE	LD	(COM),A ;	Clear Command code
FD2A 215D5C	LD	HL,23645 ;	CH ADD holds address reached by interpreter
FD2D 35	DEC	(HL) ;	Decrease CH ADD to find character which
FD2E E5	PUSH	HL	
FD2F DF	RST	#18 ;	caused the error
FD30 E1	POP	HL	
FD31 FE2A	CP	"*" ;	Was it a star ?
FD33 20D0	JR	NZ,SYNTAX ;	Error if not
FD35 34	INC	(HL) ;	Increase CH ADD to point to the next
			character
FD36 DD2119FE	LD	IX,COMTABLE ;	Index register, IX, points to Command Table
FD3A DDCB007E	70 LOOP10:	BIT	7,(IX+0) ; Has the end of the table being reached ?
FD3E 20C5	JR	NZ,SYNTAX ;	Error if it has
FD40 2A5D5C	LD	HL,(23645)	
FD43 E5	PUSH	HL ;	Save CH ADD
FD44 DD4600	LD	B,(IX+0) ;	Transfere command length to B
FD47 DF	RST	#18	
FD48 E6DF	80 LOOP11:	AND	223 ; Reset bit 5. Quicker than RES 5,A
FD4A DD23	INC	IX	
FD4C DDBE00	CP	(IX+0) ;	Do characters match ?
FD4F 201A	JR	NZ,NEXT ;	Jump to NEXT if they do not
FD51 E7	RST	#20 ;	Increase CH ADD next character to A
FD52 10F4	DJNZ	LOOP11	
FD54 FD3600FF	LD	(IY+0),255 ;	Command found
FD58 FD362600	LD	(IY+38),0 ;	Clear ERR NR and X PTR
FD5C E1	POP	HL ;	remove CH ADD from stack
FD5D DD6E01	LD	L,(IX+1) ;	Transfere parameter data to L
FD60 1105FE	90	LD	DE,PARTABLE ; Address of Parameter Table
FD63 2600	BACK1:LD	H,0	
FD65 19	ADD	HL,DE ;	Position of address in table
FD66 5E	LD	E,(HL) ;	Transfere parameter address to DE
FD67 23	INC	HL	
FD68 56	LD	D,(HL)	
FD69 EB	EX	DE,HL ;	Exchange DE and HL
FD6A E9	JP	(HL) ;	Jump to contents of HL
FD6B 48	100 NEXT:LD	C,B	
FD6C 0C	INC	C	
FD6D 0600	LD	B,0	
FD6F DD07	ADD	IX,BC ;	Increase IX to start of next command
FD71 E1	POP	HL	

PROGRAMMING: SPECTRUM

FD72 225D5C		LD (23645),HL ;	Restore CH ADD
FD75 2104FE		LD HL,COM	
FD78 34		INC (HL) ;	Increase Command code
FD79 18BF		JR LOOP10	
FD7B CD8C1C	110 STR2 :	CALL #1C8C ;	Two strings after command
FD7E CDDAFD		CALL COMMA	
FD81 CD8C1C	STR1 :	CALL #1C8C ;	One string after command
FD84 181C		JR LINEND	
FD86 CD821C	STRNUM:		
		CALL #1C82 ;	One number and string after command
FD89 18F3		JR STR2+3	
FD8B DF	NUM0 :	RST #18 ;	Nothing after command
FD8C 1814		JR LINEND	
FD8E CD7A1C	120 NUM4 :	CALL #1C7A ;	Four numbers after command
FD91 CDDAFD		CALL COMMA	
FD94 CD7A1C	NUM2 :	CALL #1C7A ;	Two numbers after command
FD97 1809		JR LINEND	
FD99 CD7A1C	130 NUM3 :	CALL #1C7A ;	Three numbers after command
FD9C CDDAFD		CALL COMMA	
FD9F CD821C	NUM1 :	CALL #1C82 ;	One number after command
FDA2 FDCB007E	LINEND:		
		BIT 7,(IY+0) ;	Has there being an error ?
FDA6 284C		JR Z,SY1 ;	Jump if there has
FDA8 FD36000B		LD (IY+0),11	
FDAC FE0D		CP 13 ;	Is the next character code 13 or 58,";" ?
FDAE 2804		JR Z,OK	
FDB0 FE3A		CP 58	
FDB2 2040		JR NZ,SY1 ;	Error if not
FDB4 FD3600FF	140 OK :	LD (IY+0),255 ;	Reset ERR NR
FDB8 FDCB017E		BIT 7,(IY+1) ;	Bit 7 of FLAGS set at runtime
FDBC 2012		JR NZ,COMMAND	
FDBE 21FEFC		LD HL,START	
FDC1 E5		PUSH HL ;	Place START on bottom of stack
FDC2 21B712		LD HL,#12B7	
FDC5 E5		PUSH HL ;	Followed by #12B7
FDC6 C3761B		JP #1B76 ;	Jump back to ROM
FDC9 21FEFC	150 RET :	LD HL,START ;	Place START on bottom of stack
FDCC E5		PUSH HL	
FDCD C3761B		JP #1B76 ;	Jump back to ROM
FDD0 3A04FE	160 COMMAND:		
		LD A,(COM)	
FDD3 87		ADD A,A ;	Calculate position of command address
FDD4 6F		LD L,A ;	in Address Table
FDD5 1115FE		LD DE,ADDTABLE ;	Address to Address Table
FDD8 1889		JR BACK1 ;	Jump back to index into Address Table
FDDA FDCB007E	170 COMMA:	BIT 7,(IY+0) ;	Did the last parameter cause an error ?
FDDE 2814		JR Z,SY1 ;	Jump if it did
FDE0 DF		RST #18	
FDE1 FD36000B		LD (IY+0),11	
FDE5 FE2C		CP "," ;	Is the character a comma ?
FDE7 200B		JR NZ,SY1 ;	Error if not
FDE9 FD3600FF		LD (IY+0),255 ;	Reset ERR NR
FDED E7		RST #20 ;	Increase CH ADD
FDEE C9		RET	
FDEF D1	180 REPB :	POP DE ;	Drop return address from stack
FDFF FD36000A		LD (IY+0),10	
FDF4 C305FD	SY1 :	JP SYNTAX	
FDF7 CDD52D	GETA :	CALL #2DD5 ;	Top of calculator stack to A
FDF8 38F3	BACK2:	JR C,REPB	

PROGRAMMING: SPECTRUM

```

FD0C 20F1          JR  NZ,REPB ;      Number out of range
FD0E C9           RET
FD0F CDA22D       GETBC:CALL #2DA2 ;    Top of calculator stack to BC
FE02 18F6          JR  BACK2
FE04 00          190 COM :DEFB 0
FE05 8EFD99FD
      94FD9FFD
      8BFD81FD
      7BFD86FD
PARTABLE:
      DEFW NUM4,NUM3,NUM2,NUM1,NUM0,STR1,STR2,STRNUM
      ;      Parameter Table
      ;      Contains address of parameter routines
FE15 1FFE0000     ADDTABLE:
      DEFW BOX,0 ;      Address Tabel. Holds addresses of
      ;      routines which deal with commands
FE19 03424F58
      0080
COMTABLE:
      DB 3,"BOX",0,#80 ; Command Table. Contains command data
      ;      Table terminated by 80H. Command MUST
      ;      be in upper case letters
FE1F CDF7FD      260 BOX :CALL GETA
FE22 3277FE          LD  (BLEN),A ;      Length of box
FE25 CDF7FD          CALL GETA
FE28 3276FE          LD  (BHEI),A ;      Height of box
FE2B CDF7FD          CALL GETA
FE2E 327E5C          LD  (23678),A ;      Y position of box
FE31 CDF7FD          CALL GETA ;      X position of box
FE34 327D5C          LD  (23677),A
FE37 AF            280   XOR  A
FE38 CD282D          CALL #2D28 ;      Stack 0
FE3B 3A76FE          LD  A,(BHEI)
FE3E CD6FFE          CALL LINE ;      A=Height Draw first line
FE41 3A77FE          LD  A,(BLEN)
FE44 CD282D          290   CALL #2D28 ;      Stack Length
FE47 AF            XOR  A
FE48 CD6FFE          CALL LINE ;      A=0 Draw second line
FE4B AF            XOR  A
FE4C CD282D          CALL #2D28 ;      Stack 0
FE4F 3A76FE          LD  A,(BHEI)
FE52 CD282D          CALL #2D28 ;      Stack Height
FE55 CD6E34          CALL #346E ;      Negate top value on stack
FE58 CDB724          CALL #24B7 ;      Draw third line
FE5B 3A77FE          300   LD  A,(BLEN)
FE5E CD282D          CALL #2D28 ;      Stack Length
FE61 CD6E34          CALL #346E ;      Negate top value on stack
FE64 AF            XOR  A
FE65 CD6FFE          CALL LINE ;      A=0 Draw last line
FE68 215827          LD  HL,#2758 ;      Reset HL' is destroyed by line drawing
FE6B D9            EXX
FE6C C3C9FD          JP  RET ;      End command
FE6F CD282D          310 LINE:CALL #2D28 ;      Stack value in A
FE72 CDB724          CALL #24B7
FE75 C9            RET
FE76 00          320 BHEI :DEFB 0
FE77 00          BLEN :DEFB 0

** pass          2
** errors        0
** warnings      0

```


Probably the best joysticks in the world

THE TOP PEOPLES CHOICE

125 +

The Explosive Joystick

Compatible with ZX Spectrum, 16k, 48k, 128k, +2, Commodore 64, Vic 20, Amstrad, Atari, etc.

At only £8.95 the features on the 125+ are second to none. Besides its unique internal structure, built to withstand immense punishment from even the most vigorous games player, the joystick contains no less than four extremely sensitive fire buttons. Two are housed in the handgrip which has been moulded for extra comfort and ease of operation. The trigger finger fire button provides ease and comfort for your finger and the top fire button is contoured to fit your thumb for sure fire shooting. The base fire buttons are positioned for extra control and two hand firing whether you are right or left handed.

A built in auto-fire switch provides continuous shooting at the touch of a fire button.

Built in Spectrum +2 Selector Connector.

The 125 comes complete with a full 12 months warranty

Prices include VAT, postage & packing. Delivery normally 14 days.

Export orders at no extra cost.

Dealer enquiries welcome.

Cheetah, products available from branches of **Dixons**

Harrods **John Menzies** **LASKYS** **WHSMITH**

High St. Stores and all good computer shops or direct from Cheetah.



A Right Royal Joystick

Cheetah MACHI + MICROSWITCH JOYSTICK

- ⚙ METAL SHAFT ⚙ AUTO FIRE
- ⚙ +2 SELECTOR CONNECTOR
- ⚙ 12 MONTH WARRANTY

ONLY
£14.95

- Deluxe, robust construction. ● Comfortable rugged hand-grip, 8 directional **MICRO SWITCH** control with automatic centering.
- Heavy duty base with strong stabilizing suction cups.
- Highly sensitive light touch **MICRO SWITCH** fire buttons.
- Ergonomically designed control handle with indestructible **METAL SHAFT**. ● Built in **AUTO FIRE** function.

MachI+Joystick compatible with: ● Sinclair ZX Spectrum 16K, 48K, 128K, +2

● Amstrad computers ● Commodore 64 & VIC 20 Computers

● Atari 2600 & Atari 5200 Video Game Systems

● Atari Home Computers

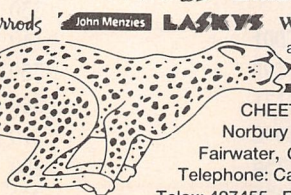
Prices include VAT, postage & packing. Delivery normally 14 days. Export orders at no extra cost.

Dealer enquiries welcome. Cheetah, products available from branches of **Dixons**

Harrods **John Menzies** **LASKYS** **WHSMITH** High St. Stores

and all good computer shops or direct from Cheetah.

Cheetah
Marketing



CHEETAH MARKETING LTD
Norbury House, Norbury Road,
Fairwater, Cardiff CF5 3AS.
Telephone: Cardiff (0222) 555525
Telex: 497455 Fax: (0222) 555527



Screen Wiz

A Kennedy

Load and save your Amstrad CPC screens, to tape, in a compact manner, including details such as the mode, ink and border.

The other utility increases the Baud rate. The commands are :LOADSCREEN, :SAVESCREEN, :SUPERSPEED.

```

40 MEMORY &9CFF
50 A=&9D00
60 s=0
70 FOR D=1 TO 24
80 READ B$
90 FOR C=1 TO LEN(B$) STEP 2
100 f=VAL("&"MID$(B$,C,2))
110 POKE A,f
120 s=s+f
130 A=A+1
140 NEXT C,D
150 READ E
160 IF E<>S THEN PRINT "Sorry, Error in DATA":END
170 CALL &9D00

180 PRINT "SAVESCREEN, LOADSCREEN & SUPE
RSPEED RSXs have been installed."
190 NEW
200 DATA 010E9D210A9DCDD1
210 DATA BCC900000000199D
220 DATA C3389DC3779DC3B6
230 DATA 9D53415645534352
240 DATA 4545CE4C4F414453
250 DATA 43524545CE535550
260 DATA 455253504545C400
270 DATA DD21BF9DCD11BCDD
280 DATA 7700CD3BBCDD7001
290 DATA DD71020610C5783D
300 DATA CD35BCDD7003DD71
310 DATA 04DD23DD23C110ED

320 DATA 21BF9D1123003E2A
330 DATA CD9EBC2100C01100
340 DATA 403E2BCD9EBCC921
350 DATA BF9D1123003E2ACD
360 DATA A1BCDD21BF9DD7E
370 DATA 00CD0EBCDD4601DD
380 DATA 4E02CD38BC0610C5
390 DATA 783DD4603DD4E04
400 DATA CD32BCDD23DD23C1
410 DATA 10ED2100C0110040
420 DATA 3E2BCDA1BCC9218C
430 DATA 003E32CD68BCC900
440 DATA 2064B
    
```

Status

Barry Dorrans

This program for the BBC will list the status of the repeat delay and rate, sound, TAB value, ESCAPE, TUBE flag, SPEECH flag,

and available RAM. Simply run the program and the machine code at &900 will be called to give the details.

```

10$BYTE=&FFF4
20$WRCH=&FFEE
30$NEWL=&FFEF
10FOR pass=0 TO 3 STEP 3
20P%=&900
30COPT pass
171LDX #&FF:STX &80:JSR print
180LDA #&BB:JSRfx
230LDA #&C4:JSRfx
260LDA #&C5:JSRfx
280LDA #&D2:JSRfx
310LDA #&DB:JSRfx
330LDA #&E5:JSRfx
350LDA #&EA:JSRfx

370LDA #&EB:JSRfx
390LDA #&FE:LDY #&FF:LDX #0:JSR $BYTE
:LDA #127:JSR $WRCH:CFX #&80:BPL modelb
:LDA #&16:JMP ret
391.modelb:LDA #&32
4999.ret:JSR printhex:LDA #ASC"K":JSR D
$WRCH:JMP $NEWL:RTS
5002.h187:EQU$ "BASIC socket: %"
5003EQU$ "Repeat delay: %"
5004EQU$ "Repeat rate : %"
5005EQU$ "Sound status: %"
5006EQU$ "TAB value : %"
5007EQU$ "<ESC> status: %"
5008EQU$ "TUBE flag : %"

5009EQU$ "SPEECH flag : %"
5010EQU$ "RAM : "
6000.fx:LDY #&FF:LDX #0:JSR $BYTE:TXA:
JSR printhex:JSR $NEWL
7000.print:LDY #0:LDX &80:.ugh:INY:INX:
LDA h187,X:JSR $WRCH:CFY #15:STX &80:BN
E ugh:RTS
10000.printhex PHA:CLC:AND#&F0:RORA
10010RORA:RORA:RORA:JSRnyb:PLA:AND#&F
10020.nyb CLC:ADC#48:CMP#58:BCC number
10030ADC#6:.number JMP&FFE3
200001:NEXT
30000CALL &900
    
```

Sound FX

A Kennedy

Four types of sound effect are made easy with this program for the Amstrad CPC range. The effects, and syntax, are :EXPLODE, :BANG, :ZAP, and :PING.

```

10 ' SOUND FX RSX
20 ' by Andrew Kennedy
30 '
40 MEMORY &9CFF
50 A=&9D00
60 s=0
70 FOR D=1 TO 20
80 READ B$
90 FOR C=1 TO LEN(B$) STEP 2
100 f=VAL("&"MID$(B$,C,2))
110 POKE A,f
120 s=s+f
130 A=A+1
140 NEXT C,D

150 READ E
160 IF E<>S THEN PRINT "Sorry, Error in DATA":END
170 CALL &9D00
180 PRINT "EXPLODE,BANG,PING & ZAP rsxs
have been installed."
190 NEW
200 DATA 010E9D210A9DCDD1
210 DATA BCC9CBA30E9D1C9D
220 DATA C32F9DC3459DC371
230 DATA 9DC35B9D4558504C
240 DATA 4F44C542414EC75A
250 DATA 41D050494EC70021
260 DATA 359DC3879D000000

270 DATA 0000000F07101010
280 DATA 001E000000214B9D
290 DATA C3879D0000000000
300 DATA 001F071010100004
310 DATA 00000021779DC387
320 DATA 9D6400CB00C90000
330 DATA 38101010001E0000
340 DATA 0021619DC3879DCB
350 DATA 00CB00CB00003810
360 DATA 1010001400000006
370 DATA 00C57E4F78CD34BD
380 DATA 23C1047BF0E020F1
390 DATA C9,12152
    
```


GOOD TIDINGS AND SMALL BILLS

When PCW last looked at Mercury Communications, the service was just becoming available to home and small business users. Savings of between 15 to 20 per cent on phone bills were claimed. Nine months later, Steve Gold looks back at how the system saves him a lot of money on phone bills . . .

It was about a year ago that I first heard that Mercury intended to offer an alternative telephone service to home and small business subscribers. At the time my phone bills from British Telecom were of the order of £800 to £1,000.

A year later – and after being subscriber to the Mercury 2300 service for nine months – my overall bills from Mercury and BT are down £450 a quarter – a saving of about 50% and way above Mercury's claimed call savings.

"How is this?" I hear you ask. Before explaining how, it's important to realise that computer modem users are unlike the average subscribers that Mercury pitches its promotional literature at.

Many modem users make a higher proportion of trunk telephone calls than typical residential customers. This is probably because most bulletin boards are an 'a' or 'b' rate trunk call away. Granted, BT's packet switch stream and Prestel services are available on a local call basis for many UK subscribers, but the majority of modem users have an innate desire to communi-

cate with the world – there's something inherently satisfying in communicating with a bulletin board at the other end of the country, rather than just across the city.

Mercury in perspective

As can be seen from the inset box, the Mercury 2300 service is not a direct replacement for BT services. Subscribers to Mercury must still rent their lines and – in the majority of cases – place local calls via British Telecom. At present, Mercury 2300 subscribers can only achieve call cost savings on trunk and international routes.

For many modem users, however, trunk and international calls account for a major proportion of a telephone bill. Even with Prestel subscriptions all the rage, many modem users still make more than the odd call to bulletin boards several hundred miles distant.

Personal experience

Take my own bills for example. As a computer journalist (stop laughing at the back) who works from home, I make several calls a day to computer manufacturers, both in the UK and abroad, in a bid to get the news before my competitors.

I also edit frames on Micronet 800 on Prestel, as well as subscribing (and supplying computer news) to several electronic mail services both in the UK and abroad, which runs up the bills.

As a rough guide then, about £20 of my original BT-only bills is/was attributable to line and equipment rental, plus another £80

"It's important to realise that computer modem users are unlike the subscribers that Mercury pitches its promotional literature at."

or so per quarter for local calls. This still left a further £700 for trunk and international calls – many of which were made outside of the cheap rate periods.

My latest BT quarterly bill cost me about £140 – the extra £40 or so above my rental plus local calls estimate is for the small residue of trunk calls made via BT. My Mercury bills are rendered monthly and directly debited to my Visa credit card as a matter of course. A typical month's charges work out at about £100 – equivalent to £300 for the quarter as a whole.

The advantages of Mercury

As outlined in my article on Mercury earlier this year, the advantages which accrue from using Mercury 2300 in preference to BT for trunk and international calls include clearer calls, as well as lower call costs.

In addition to this, the Mercury service centre now offers a complete BT-style operator and directory enquiry service. Like BT, Mercury calls to the operator and

"After being a subscriber to the Mercury 2300 nine months, my overall bills from Mercury and BT are down £450 a quarter."



LEADING SOFTWARE DEVELOPMENT GROUP REQUIRE 68000/280/6502 ASSEMBLY LANGUAGE PROGRAMMERS.

Our company is currently coding major games titles for large publishing companies. First class development equipment, good salaries and relocation expenses.

Source would also like to hear from
TALENTED GRAPHIC ARTISTS.

Telephone ADRIAN SCOTNEY
on 0943-467511
or send details of experience to:

SOURCE LTD
LENCETT HOUSE,
45 BOROUGHGATE,
OTLEY, LS21 1AG

The Best Software Shop in Town

ULTIMA

WHITE LION WALK GUILDFORD SURREY
TELEPHONE 0483-506939
31 HANOVER BUILDINGS SOUTHAMPTON
TELEPHONE 0703-39419
OPPOSITE MACDONALDS

MORE DISCOUNT

Mark Downs
Promotions
Special Deals

MORE SERVICE

Free Tape Head
Alignment service
Demonstrations
Club Membership
Order by Phone

MORE CHOICE

Over 500 Titles
in stock
Large selection of
Discs
Amstrad
6128*PCW*PC
Atari ST*XE
Spectrum
Commodore
Amiga*C16*C64
BBC*Electron
MSX
Full range of
joysticks*Cables

directory enquiry positions are free of charge. Service is much improved over BT's. This is probably due to the relatively low number of subscribers to Mercury 2300 – 10,000 at the last count, but that figure is rising fast.

Still, I now find it possible to get a call to Mercury directory enquiries answered within 20 seconds, regardless of what time of the day or night a call is placed. Compare that to the delays experienced in the late evening or middle of the night for the BT service and I think you'll agree, Mercury directory enquiry service is infinitely better.

Mercury operators are also able to interrogate your billing files at all times – another plus when you want to ask a billing quotation on Sunday morning. Add to that a really friendly service, and the human element of Mercury calls is big plus in the service's favour.

The disadvantages

Contrary to what you might think from the foregoing, there are still disadvantages in using Mercury 2300 over the BT service for trunk and international calls. These include

- **Call delays** – Using BT, it rarely takes longer than 15 seconds before a tone is heard on an inland direct dialled call – either ringing or engaged signals in the vast majority of cases. Because all Mercury 2300 calls must pulse dial the three digit Mercury access code (usually 131), then log onto Mercury using a ten digit ID, calls take an average of 5 to 10 seconds longer to complete via Mercury 2300, than if made via BT. In practice, this delay is only a minor niggle.

- **Network failure** – Because the Mercury network is so new, and relies upon BT to interconnect calls at both ends of the circuit, there is more to go wrong with a typical trunk call. On at least three separate occasions over the past six months the Mercury network has been down for a period of between 20 and 120 minutes. To be fair to Mercury, these failures only occurred at relatively off-peak times – Saturday or Sunday mornings. Calls via British Telecom can be made as normal during such times, so telephone service is not entirely unavailable.

- **Intermittent network failure** – Some calls fail because the Mercury access ports on 131 are either engaged or simply ring out. Redialling the call normally solves the problem. For the inexperienced or novice user of Mercury 2300, however, an engaged Mercury port could be construed as the engaged tone on the number dialled.

- **Poor quality circuits** – As can be seen from the network map, Mercury currently covers much of the UK's major centres of population, with extensions into Scotland and the south coast promised by the end of October. Despite such limitations, Mercury

accepts calls to any UK destination, relying on BT circuits to complete the call to areas where Mercury service is not yet available. On some calls to the far north of Scotland and west of Cornwall, call quality is relatively poor and therefore unsuitable for modem use. Such calls – admittedly few and far between – require the use of BT for successful use of a modem. This factor accounts for the extra £40 or so on my quarterly BT phone bill.

Apart from these problems, Mercury 2300 service is far superior to that provided by BT. Eventually, BT will catch up with Mercury, but it will take until at least 1995

What is Mercury 2300?

The Mercury 2300 service allows residential and small business users to access the Mercury network via existing telephone lines. Provided you have one of the new square pin plugs on your telephone, all you need is a Mercury smart phone (cost £51.95 including VAT), plus a Mercury authorisation ID (£7.50 plus VAT a year).

Once programmed, you use your Mercury phone for all your calls – dialling as usual for local calls (via BT), but pressing the blue 'M' (for Mercury) button in prefix to the trunk and international access codes.

Mercury then bills all your trunk and international calls – individually itemised and costed – each month or quarter. You continue to rent your ordinary phone line from British Telecom, and place local calls via BT as normal. Trunk calls are also available – albeit at greater cost than via Mercury – as normal.

The advantages over BT service – which Mercury only supplements, not replaces – include call itemisation, lower costs and clearer circuits.

Mercury 2300 service is currently available in most major centres of population (see network map).

before true digital call quality – as seen on Mercury circuits – becomes available on the BT network.

Call savings explained

As I've already mentioned, Mercury claim typical trunk call savings of between 15 and 25 per cent. In my own case, however, these savings amount to about 50 per cent. After some thought on the matter, I attribute the considerable call savings to the following factors:

- **Fewer data errors** – Since many of my modem calls involve the use of an error correction protocol – MNP for high-speed modem calls, and Kermit or Xmodem for file transfers – the number of corrupt data

packets is considerably reduced. Mercury circuits rarely give any problems at V23 (1200 baud) or V22bis (2400 baud).

- **Faster modem speeds** – Because Mercury 2300 uses digital-quality circuits, compared with BT's predominantly analogue network, call circuits are better able to support the higher modem speeds such as V22 (1200 baud) and V22bis (2400 baud).

- **More incoming calls** – Because of the faster modem speeds, my home phone line is engaged for shorter periods, allowing more time – particularly during office hours – for people to call me, instead of leaving messages for me to call them on my London voicebank answerphone.

Mercury's future enhancements

At the time of writing, Mercury has just completed reciprocal agreements with the telecommunication authorities in Japan and Scandinavia. Further agreements are pending with other international telecommunication authorities.

Such agreements open up call savings of as much as 20% over BT call costs on international calls – savings already seen on transatlantic calls to the US and Canada. Currently, Mercury is obliged to hand over much of its international call traffic to BT, allowing it to pass on only a small call savings (between 2 and 4 per cent) as its 'agent's commission' for handling the call.

Retransmission from Mercury to BT can also add to the general line noise and lack of signal quality on international calls. This factor tends to negate the call quality advantages of placing calls over the Mercury national network. Once direct connection between Mercury and the rest of the world is available, better call quality – perhaps to digital standards – will be available.

Conclusions

In my first article on Mercury, I suggested that anyone with a quarterly telephone bill – modem user or not – in excess of £75 would be well-advised to consider Mercury as an additional extra to their telephone service.

Since that article, I calculate that figure as a little conservative and – allowing for a two year payback period on the £51.59 smart phone – suggest a figure £70 as the point beyond which most modem users would benefit financially from using Mercury 2300.

Even if your phone bill is below the £70 mark – and there can be few modem users with bills at such low levels – the digital call quality benefits to be derived from Mercury 2300 are still worth the investment. Some Hayes-compatible modem users will find that, if their modem has a tone dialling option, then a smart phone is not needed. At £7.50 (plus VAT), Mercury 2300 telephone service is a bargain not to be missed.

MICRO-FILE

SOFTWARE

JUMPDISK

MONTHLY MAGAZINE ON A DISK

For the **AMIGA**

SEPTEMBER ISSUE STILL AVAILABLE

ARTICLES

NFL ORACLE: Documentation for program.
TRANSFORMER FOR 1.2.
AMIGA DISK: Sensitive Topic, a guide to buying disks.
C NOTES: Program in "C", a new tutorial.
PATTERN MAKER: Documentation for program.
NEWSBREAKS: What's Happening.
PD DISKS: £3 each, 110 Available.
SHORTCUT! A Macro Bionic Diet.
CLICKSAY: How You Can Use It.
BIORHYTHM: Instructions for program.
PRISM: Review of HAM Art Maker.
READERS' FORUM: You Write This.
JUMPSTART BASIC: How-to Series.
TIPS: Readers Share.
FAERY TALE: Review.
ROBOT READERS: Review.
THE EDITOR'S TWO CENTS SUBMISSIONS: We're a Paying Market.

PROGRAMS

NFL ORACLE '87: Last Year it Picked 63% of Pro Football Winners.
PATTERN MAKER: Edit Amiga Basic Patterns.
SHORTCUT! (Shareware): Macros for the CLI.
BIORHYTHM: Have a Nice Chart!
LIGHTYEAR EXCUSE: Science Fiction, Ch. 2.
ZIPPY THE WONDER CAR: Light-year Arcade Game.
CLICKSAY: Point-and-Click Speech.
AESOP: Clicksay for Young Readers.
20 MATCHES: Can You Beat the Computer?
SKYWRITER: Template for Titles.
ATPATCH (From PD Disk): Transformer 1.2 Patch.

£8.50 inc. VAT

OCTOBER ISSUE NOW ON SALE

ARTICLES

IGNITION: How to boot Workbench direct to a Basic program.
DIGI-PAINT: Review HAM artmaker release.
PD DISKS £3 EACH: Offering 110 selections.
STUDY AND CARD FILE: The documentation.
C-NOTES: C programming series.
ECLIPSE: Documentation.
BLITZ TEXT VIEWER: Documentation.
LOGISTIK: Review. A look at integrated software.
A-TALK vs MACROMODEM: Review. Two telecommunicators.
SPEEDY3: Supercharging transformer.
DISK LIBRARY: Documentation.
WHAT THE HEX: Learning number systems.
READERS FORUM: Hey, lighten, up gang!
FLUSH RIGHT: Documentation.
HALLOWEEN HOST: Personalizing it.
READER TIPS: A selection.
THE EDITOR'S TWO CENTS: The editor rambles on and on.
LIGHTSPEED GALLERY: Macabre art screens.
Plus: Some surprises.

PROGRAMS

STUDY AID CARD FILE: Helps students learn. *James B. Parks.*
DISK LIBRARY: Organise your collection. *David Anspach.*
WORD SEARCH: Makes puzzles, you solve them. *J.E. Charlsen.*
ECLIPSE: Celestial simulations. *David Anspach.*
CALENDAR: Generates calendar pages. *J.E. Charlsen.*
MAGIC SQUARES: Explained. *Al Comroe.*
HALLOWEEN HOST: A pumpkin's snappy patter. *Virginia Cieli.*
FLUSH RIGHT: Justifies text files. *Emily Quizenberry.*
BOLERO: Music from French PD disc. *'Professor X'*
BLITZ TEXT: Fast text viewer.
BLINKER: Title screen animation.
PRINTALL: Prints all articles to paper.
SPEAKALL: Speaks all articles.
PRIMES: C course and code.

£8.50 inc. VAT

SPECIAL OFFER TO COMMEMORATE THE PCW SHOW. ORDER THE SEPTEMBER AND OCTOBER ISSUES AND PAY ONLY £16.00 inc. VAT.

TO: **GEORGE THOMPSON SERVICES LTD,**

Dippen Lodge, Dippen, Brodick, Arran KA27 8RN. Scotland. Tel: (077 082) 234

Please send the SEPTEMBER ☐ OCTOBER ☐ ISSUES to me by return.

NAME

ADDRESS

I enclose a cheque or money order for £8.50 ☐ £16.00 ☐

Price includes first class P.&P. within U.K. & EUROPE. SAME DAY DESPATCH OF ORDERS. THERE IS A GUARANTEE WITH EVERY ISSUE

(470)

Central Media shop now open at address below

CENTRAL MEDIA

**WE SELL
ATARI ST
HARDWARE**
Ring for
details

520 STFM
£275
1040 - £475

3.5 INCH DISCS
10 UNBRANDED S/S D/D £9.95
10 UNBRANDED D/S D/D £10.95

5.25 INCH DISCS
10 DATATECH D/S D/D 96tpi £7.99
10 DATATECH D/S D/D 48tpi £6.50
10 TDK S/S D/D 48tpi £5.99
10 AMSOFT CF2 3" £24.00

All prices inc. VAT & P.&P.
TRADE ENQUIRIES WELCOME

Central
Media will be
levitating at
the P.C.W. Show,
be sure not to
miss their act!

ALL CHEQUES & PO's PAYABLE TO
CENTRAL MEDIA
101 SPRING BANK, HULL HU3 1BH
TEL: (0482) 26581

(308)

ARE YOU IN A RUT??

Then climb out by learning to use your
COMPUTER for pleasure, personal or business
use with our unique range of . . .

OPEN LEARNING COURSES

Phone (0206) 560783 24 hours

or send for FREE details to:
MICROWISE UK, FREEPOST, Colchester CO3 4BR

Name Micro

Address

P38

(473)

ADVERTISING RATES FOR MICRO-FILE

Semi Display
Lineage

£8 per single column centimetre (+VAT)
35p per word (+VAT)

CALL SUSANNAH KING or ROBERT COLE on 01-834 1717 FOR SEMI DISPLAY ADVERTISING

PANTHER SOFTWARE!

"The No. 1 Mail Order Centre"

More stock than you can imagine. Please send S.A.E. envelope for list, state which computer you want info on.



Title	Our Price
Peripherals	21.99
Joystick IBM	17.95
Light Pen Amstrad PC1512	65.95
Mouse IBM	2.25
Mouse Mat	1.80
5x15 Standard Tape	3.40
10x15 Standard Tape	6.95
Joystick 125+Chetah	12.99
Joystick Match 1	6.95
Joystick Quicksot II Plus	9.95

IBM PC Games	
Borrowed Time	20.95
Championship Golf	30.95

Title	Our Price
Basketball	22.49
Portal	22.49
Fourth Protocol	17.95
Bridgemaster	17.95
Alex Higgins Snooker	17.95
Cyrus II Chess	17.95
Winter Games	17.95
Pit Stop 2	17.95
Fahrenheit 451	17.95
Trivial Pursuit	22.49
Saboteur 2	13.49
Jewel of Darkness	17.95
Space Max	39.99
Deadline	26.49
Passengers On The Wind	22.49
Hobbit	26.49
F15 Strike Eagle	19.49
Solo Flight	17.95
Top Gun	17.95
G.A.T.O.	22.49
World Games	22.49

Title	Our Price
☆☆ SPECIAL OFFER ☆☆☆	
Company 87 and Dailynews	20.99
100 Capacity Disk Box and 25 blank disks	28.49

☆ Offer ends 30th September 1987 ☆

Business and Utilities-IBM	
Designers Pencil	26.49
Music Studio	30.95
WordStar 1512	65.95
Art Studio	43.99
Fleet St. Editor	131.95
Dock Keeper	99.85
Accountant	150.84
Accountant +	199.99
Financial Control	299.99
Password PC	22.49

Atari ST Games	22.49
Baseball	22.49

Orders under £7.00 please add 50p for P&P.

Title	Our Price
Basketball	22.49
Int. Karate	17.95
Little Comp. People	30.95
Skyfox	22.49
Trailblazer	22.49
Leather Goddess Of Phobos	26.49
Deadline	26.49
Passengers On The Wind	22.49
Turbo G.T.	13.95
Ninja	9.49
Karate Kid 2	22.49
Airball	22.49
F15 Strike Eagle	19.49
Ultima 3	22.49
Balance Of Power	26.49
Chess	22.49
Hardball	22.49
Leaderball Golf	22.49
Roadwar 2000	22.49
Winter Games	22.49

Title	Our Price
World Games	22.49
Print Master	26.49
Hobswriter	52.95
Lattice C Compiler	87.95
Animator	26.49

AMICA Games	
Golf	30.95
Hollywood in jinx	26.49
7 Cities of Gold	26.49
Skyfox	26.49
Artic Fox	26.49
Ballyhoo	26.49
Moon Mist	26.49
Silent Service	22.49
Balance Of Power	34.95
Sinbad	34.94
S.D.I.	26.49
Deep Space	26.49
Winter Games	22.49

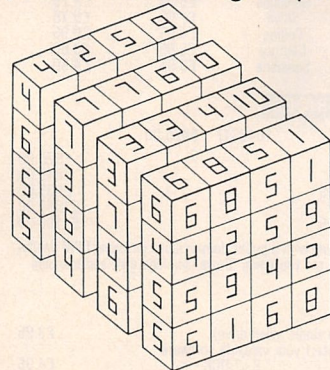
Title	Our Price
Music Studio	30.95
Mr-Amiga File	87.95
Lattice C	113.95
Lisp	129.95
Pascal	70.95

☆☆ DISKS ☆☆☆	
10x5.25 DS 48TPI disks & plastic library case	8.99
10x5.25 DS 48TPI disks	7.49
20x5.25 DS 48TPI disks	13.99
25x5.25 DS 48TPI disks	16.49
50x5.25 DS 48TPI disks	28.99
10x5.25 DS 96TPI disks	8.49
25x5.25 DS 96TPI disks	17.49
100 Capacity 5.25 lockable disk box (supplied with dividers and keys)	13.99

Please make all cheques payable to PANTHER SOFTWARE, 2 Riverway Gardens, The Meadows, Nottingham NG2 3LL or Phone: The Hotline 0602 860 664

THE MAGIC CUBE PUZZLE

(3 dimensional magic square puzzle)



On the left is shown a row of magic squares which together form a magic square in three dimensions called a magic cube.

The ultimate aim of this package is to reconstruct a jumbled up magic cube after first mastering the two dimensional version.

There are interesting number patterns which can help you in this task.

Available on cassette for the BBC Model B Microcomputer PRICE £7.99

MOSAICA SOFTWARE, 4/15 The Grange, London SW19 4PS. Tel: 01-946 4821

IF ANYONE DOES ANYTHING CHEAPER WE WILL BEAT THEM!

Phone for the best price.

5 1/4" DS D/D		3 1/2" DS/D/D	
10.....	£5.90	10.....	£10.90
25.....	£12.50	25.....	£28.95
50.....	£19.95	50.....	£55.75

3" MAXELL CF2 (10).....£20.00

80 capacity 5 1/4" LSB.....	£8.00	Spectrum 128+.....	£99.00
100 capacity 5 1/4" LSB.....	£11.00	Citizen 2 col. dot matrix printer	£28.95
3 1/2"/5 1/4" library cases.....	95p	Datex Microstick joystick.....	£8.99
40 capacity 3 1/2" LSB.....	£7.95	C2N data recorder.....	£25.99

All prices include VAT and postage.
ALL TRADE ENQUIRIES WELCOME.

M.D.S. Computer Supplies

11 Church Street, Banbridge BT32 4AA

Credit Card Hotline 10am-7pm
(08206) 23477

A Division of Brocklis Enterprises Ltd.

(468)

SUPER FANTASTIC VALUE SUMMER MADNESS

Due to huge demand we have more stock available. Please contact us for best prices on all software/wareware

CROWN CROWN CROWN CROWN CROWN

BUSINESS SOFTWARE

AMSTRAD CPC	TAPE	DISC
Mini Office 2.....	13.50	17.99
Quill/Illustrator.....	21.95	—
Card Box.....	—	52.99
D-base 2.....	—	109.00
Art Studio.....	—	17.99
Popular Accounts.....	—	89.95
Super Calc 2.....	—	44.95
Tasprint.....	8.99	11.75
Tasword.....	17.95	21.99

AMSTRAD PC	TAPE	DISC
Wordstar.....	—	62.99
Card Box.....	—	52.99
D-base 2.....	—	109.00
Art Studio.....	—	17.99
New Word.....	—	62.00
Super Calc 2.....	—	44.95

AMIGA	TAPE	DISC
Instant Music.....	22.50	—
Music Studio.....	29.99	—
Deluxe Paint 2.....	62.95	—
Deluxe Print.....	22.50	—
Superbase Personal.....	89.95	—
Textcraft.....	£60.00	—
+ Games at low prices	—	—
New Release Spec.	—	—
Mercenary.....	8.95	—

COMMODORE 64	TAPE	DISC
Geos.....	47.50	—
Mini Office.....	13.50	—
Quill/Illustrator.....	23.99	—
Advanced Art Studio.....	22.50	22.50
Music System.....	13.50	15.95
Art Studio.....	13.50	15.50
Tasword.....	12.99	17.99
Home Account.....	15.50	17.95

COMMODORE 128	TAPE	DISC
Swift Spread Sheet 128.....	—	21.99
Dbase 2.....	—	109.50
C128 Compiler.....	—	36.50
Super Script 128.....	—	65.95

ATARI ST 128	TAPE	DISC
Mini Office 2.....	—	17.95
Music Creator.....	—	17.95
Print Shop.....	—	35.99
Stock Control.....	—	45.00
Haba Writer.....	—	53.95
+ Games at low prices - Phone	—	—

SPECTRUM	TAPE	DISC
Art Studio.....	12.99	—
Lastword.....	12.99	—
Mini Office.....	5.50	—
Quill/Illustrator.....	19.95	—
Tasprint.....	8.50	—
Tasword 2.....	12.50	—
Tasword 3.....	13.99	—

POPULAR GAMES	TAPE	DISC
Elite.....	9.95	12.50
Fist II.....	8.95	13.50
Rana Rama.....	7.95	13.95
Metrocross.....	7.95	13.99
Army Moves.....	7.95	13.95
Krak Out.....	8.95	13.99
Tomahawk.....	8.95	13.95
Short Circuit.....	7.95	11.50
Future Knight.....	8.95	13.50
Escape From Finges Castle.....	8.95	12.95
Hyper Ball.....	8.99	13.50
Light Force.....	7.95	13.50
The Double.....	8.99	—
Ace Of Aces.....	7.99	12.50
Cobra.....	7.95	11.95
Jail Break.....	7.95	13.50
Gunship.....	12.99	16.99
Breakthrough.....	8.99	13.50
Aliens.....	7.99	11.50
Silent Service.....	8.99	13.50
Auf Wiedersehen Monty.....	7.95	13.99
Samurai Trilogy.....	8.95	13.50
Indoor Sports.....	7.95	13.50

TOP TEN GAMES	TAPE	DISC
1. Paperboy.....	8.95	13.50
2. Exolon.....	7.95	11.50
3. Avenger.....	8.95	13.50
4. Barbarian.....	8.99	11.50
5. Roadrunner.....	8.99	13.50
6. Whizzball.....	7.95	11.50
7. Last Ninja.....	8.99	13.50
8. Living Daylights.....	8.95	11.50
9. Enduro Racer.....	8.99	13.50
10. Pirates.....	13.50	17.95

Cheques and POs to:

CROWN SOFTWARE

47 Crown Drive,
Spalding, Lincolnshire.

Tel: 0775 69058

Send S.A.E. envelope to us now! for Autumn specials list (466)

CROWN COMPUTERS!!!

ANY PRICE AND WE WILL MATCH IT!!!

In Stock now

Atari 520 STFM.....	269.95
Amiga 500 Sports Bundle.....	519.00

NEW

PC 1640 Mono Single Drive.....	539.95
PC 1640 Colour Single Drive.....	699.95
PWW 95 12 Mono/M Daisy Printer + Software.....	539.95
PC 1512 Mono Single Drive.....	445.45
PC 1512 Colour Single Drive.....	599.00

Commodore, Amstrad, Spec 10% off RRP

And remember our prices inc. P.&P. & VAT

**47 Crown Drive,
Spalding, Lincolnshire**

Hotline: 0775 69058

No hidden extras what you see is what you pay!

STORT SOFT

ATARI MAIL ORDER SPECIALISTS

INCREDIBLE LOW PRICES!

ALL DISKS CARRY A NO QUIBBLE REPLACEMENT GUARANTEE ARE CERTIFIED 100% ERROR FREE AND COME WITH LABELS, 5 1/4" ALSO HAVE SLEEVES AND WRITE PROTECTS. FLIP SIDED DISCS HAVE TWO INDEX HOLES AND TWO NOTCHES.

SPECIAL OFFER !!

25 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£16.00
50 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£25.00
100 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£39.95
25 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£17.00
50 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£26.50
100 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£42.00

5 1/4" DISCS FROM AS LITTLE AS 33 PENCE

BLANK 5 1/4" DISKS

DISK NOTCHER FREE WITH EACH 100 DISKS PURCHASED

UNBRANDED	TRIAL 10	25	50	100	10 in a plastic lib. case
SS48 TPI	£4.50	£9.00	£17.00	£33.00	£5.50
DS48 TPI	£5.50	£11.00	£19.00	£35.00	£6.50
DS96 TPI	£6.50	£13.00	£21.00	£37.00	£7.50
DS96 TPI FLIP SIDED	£7.00	£14.00	£22.00	£38.00	£8.00
MIMIC FLIP SIDED DS96 TPI	£8.95	£20.00	£38.00	£70.00	£9.95
MIMIC HIGH DENSITY 1.6meg	£23.00	£52.00	£100.00	£180.00	£24.00
COLOURED - mix & match or all one colour					
SS48 TPI	£6.50	£12.00	£22.00	£42.00	£7.50
DS48 TPI	£7.50	£14.00	£24.00	£44.00	£8.50
DS96 TPI	£8.00	£16.00	£28.00	£50.00	£9.00

SPECIAL PRICE!! Dysan DS48 TPI BOX OF 10 ONLY £10.95

LOCKING DISK BOXES

5 1/4" HOLDS 50	£7.95	5 1/4" HOLDS 100	£9.95
3 1/2" HOLDS 40	£7.95	60/90 (HOLDS 60 3" or 90 3 1/2")	£9.95

3.5" SPECIAL OFFERS

25 SS/DD 135 TPI(MF1DD) & 80 or 60/90 locking disc box	£35.00
50 SS/DD 135 TPI(MF1DD) & 80 or 60/90 locking disc box	£59.95
25 DS/DD 135 TPI(MF2DD) & 80 or 60/90 locking disc box	£39.95
50 DS/DD 135 TPI(MF2DD) & 80 or 60/90 locking disc box	£65.00

FULL RANGE OF ATARI HARDWARE & SOFTWARE - BEST PRICES - RING FOR DETAILS!

Just write for more information. Cheques etc. payable to STORT SOFT (International orders add 10% and remit in pounds Sterling by bank draft or intl. money order. Write for quote in any other currency)

ACCESS/MASTERCARD/EUROCARD/VISA accepted. CREDIT CARD ORDER LINE - 0279 89509
24 HOURS A DAY, 7 DAYS A WEEK - VAT & P.P. INC. NO HIDDEN EXTRAS - WHAT YOU SEE IS WHAT YOU PAY

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD, HERTS CM22 7NX

135tpi unbranded	10	25	50	100	500	10 in a case
SS/DD (MF1DD)	11.95	29.00	57.00	98.00	?	12.95
DS/DD (MF2DD)	13.95	33.00	62.00	110.00	?	14.95

COMPUTER STATIONERY

PRINTER PAPER - Continuous fan fold, sprocket fed.

SHEETS	11" x 9.5" 60gsm	A4 70gsm	11" x 9.5" 90gsm	A4 90gsm
500	£4.95	£6.95	£9.00	£9.95
1000	£8.95	£10.95	£14.00	£15.00
2000	£13.95	£16.50	£24.00	N/A

LABELS - Continuous fan fold, sprocket fed.

	70mm x 36mm	89mm x 36mm	102mm x 36mm	89mm x 49mm
1000	£4.15	£4.25	£4.50	£5.75
2000	£7.50	£7.90	£8.40	£10.50

Please specify number of labels across (1, 2 or 3)

BOOKS - END OF SUMMER BARGAINS!

	Publisher	R.R.P.	Our price
Atari Basic	Wiley	£9.75	£5.50
Atari Graphics & Sound	Wiley	£9.00	£4.95
Atari 130XE Mach. Lang. For Beginners	Melborne	£8.95	£4.00
Atari 130XE Games Book	Melborne	£8.95	£4.00
Advanced Spectrum Mach. Lang.	Melborne	£8.95	£6.50
Mach. Code Applications For ZX Spectrum	Sunshine	£6.95	£2.75
Creating Arcade Games on your ZX Spectrum	Interface	£9.95	£2.75
Advanced Mach. Code Programming For CBM64	Granada	£7.95	£5.95
The Complete Commodore (488 pages)	Granada	£9.95	£5.95
Machine Code Master (A Library of M/C Routines)	Sunshine	£6.95	£5.75
Commodore 64 Assembly Language	Shiva	£7.95	£5.75
Advanced Commodore 64 Basic Revealed	Collins	£9.95	£6.95
Micro Wars On The CBM 64	Century	£5.95	£3.50
Business Applications For The CBM 64	Sunshine	£5.95	£4.50

ATARI HARDWARE - BARGAIN PRICES

520 STFM £279.95	1040STF £425.00	
1040 STF & SM125 mono monitor		£570.00
Mega ST (2 megabyte RAM & 1 meg drive)		£845.00
Mega ST (2 megabyte RAM & 1 meg drive) & SM125		£935.00
Mega ST (4 megabyte RAM & 1 meg drive)		£1095.00
Mega ST (4 megabyte RAM & 1 meg drive) & SM125		£1190.00

All Hardware comes with free dust covers!! All STs come with 5 public domain disks including CPM emulator and the arcade game Megaroids, 5 blank discs to get you going. Basic language disk and manuals.

COMPUTER ACCESSORIES

5 1/4" DISK NOTCHER (Double your disk capacity on a single sided drive)	£3.95
DISK CLEANING KITS Liquid non-abrasive type - protect your valuable software	
5 1/4" DCK £3.95	3 1/2" DCK
ST/IBM/AMSTRAD 1512 TO CENTRONICS PRINTER LEAD (2 metres)	£4.95
ST TO RS232 MODEM LEAD (2 metres)	£8.95
BATTERY POWERED MINI-VAC - for keyboards, printers etc.	£8.95

(461)

CRIBBAGE

The popular pub game six card cribbage is now available for the Spectrum 48K/128K

Features include:

**IMPRESSIVE FULL COLOUR
PLAYING CARD GRAPHICS
100% MACHINE CODE
TWO LEVELS OF PLAY
AUTOMATIC SCORING
HELP OPTION FOR BEGINNERS**

Six card cribbage is suitable for both beginners and experienced crib players and comes with full instructions and rules of the game.

★ ★ ★ ★ MONEY BACK GUARANTEE ★ ★ ★ ★

If you are not delighted with six card cribbage then simply return the tape within 5 days and your cash will be refunded.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Send cheque or postal order for £6.50 to

ESEM SOFTWARE

112 Wrington Close, Little Stoke, Bristol BS12 6EJ

Tel: 0454 612811

(260)

DEE JAY SAVERS

TAKE A LOOK AT THESE PRICES !!!

ATARI	R.R.P.	Our Price	AMSTRAD	DISK	CASS.
Leader Board	19.95	16.60	Eidolon 112 20		8.50
International Karate	19.95	16.60	Thai Boxing	11.00	7.20
Thai Boxing	19.95	16.60	Kung Fu Master	12.50	8.00
Winter Games	24.95	21.00	Impossible Mission	12.30	8.50
World Games	24.95	21.00	Space Harrier	12.50	7.50
Karate Kid II	4.95	21.00	Yio Ar Kung Fu	11.00	7.50
Silent Service	24.95	21.00	Jailbreak	12.50	7.50
Pawn	24.95	20.99	Cop Out	11.80	7.50
Q Ball	19.95	16.60	Dragons Lair	12.50	7.50
Zork III	24.95	20.99	Crystal Castles	12.50	8.50
Star Glider	24.95	21.00	Infiltrator	12.50	8.50
Hitch Hikers Guide	28.95	24.50	Breakthru	12.50	8.50
Journey Into The Lair	95.00	85.00	Batman	12.50	7.50
Degas Elite	89.95	59.95	Cobra	12.50	7.50

FAR MORE STOCK available for the Commodore 64, 16 and Amiga, Amstrad, Amstrad 8256, Atari, ST, Electron, IBM, MSX, Spectrum and lots of Hardware and miscellaneous. Why waste money and time when you can get it all at the biggest and best new Mail Order Centre.

Send S.A.E. stating which computer you require info on and please make it a large envelope#

COMMODORE 64	DISK	CASS.	SPECTRUM	
Leader Board	12.50	8.50	Top Gun	6.75
Hard Ball	12.50	8.15	Spindizzy	8.50
Pub Games	9.00	8.20	Hacker II	8.50
Trivial Pursuits	17.00	12.00	Whistlers	8.50
Bomb Jack	12.50	8.50	5 Star Games	8.50
Bomb Jack II	12.50	8.50	Trivial Pursuits	12.60
Paperboy	12.50	8.50	Commando	6.80
Gauntlet	12.50	8.50	Jack The Nipper	6.75
Star Glider	15.00	12.40	Jailbreak	6.75
Green Beret	11.00	7.50	Marble Madness Construction Set	7.50
			Silent Service	8.49
			Inspector Gadget	7.60
			Rambo	6.80
			Trap Door	6.80
			Miami Vice	6.75
			Terre Cresta	6.75
			International Karate	6.50

Please realise we have so much stock we can advertise a fraction of it!!!

BUDGET GAMES	SPEC.	C64	C16	ATARI	AMS.	BBC
Kick Start	1.69	1.69	1.69	1.69	—	—
Chiller	1.69	1.69	1.69	—	1.69	—
Bump Set Spike	1.69	1.69	—	—	—	—
Vegas Jackpot	—	1.69	1.69	1.69	—	1.69
Speed King	—	1.69	1.69	1.69	1.69	—
Speed King II	1.69	—	—	—	—	—
Finders Keepers	1.69	1.69	1.69	—	1.69	—

Please send a large S.A.E. to us right now for a Price List

PERIPHERALS		
C128 Compendium Pack	265.00	Disk Box 5.25" 100 Disks Lockable
Saga Emperor Keyboard	39.95	Arcade Turbo Joystick
Disk Box 5.25" 80 Disks	30.00	Quickshot 2 Turbo

Please make all cheques payable to:

DEE JAY SAVERS

62 Eagles Close, SITTINGBOURNE, Kent ME10 3RA

Send self-addressed envelope now!!!

Stating computer for incredible Price List.

Telephone: (0795) 27783 or (0689) 32781

Dee Jay Savers

Dee Jay Savers

FOR SALE

PUBLIC DOMAIN SOFTWARE FOR IBM/AMSTRAD PCs

We have an excellent selection of software including... PC-Write, New York Word, PC File, PC File+, PC Calc, Spelling Checker, Chiwriter, PC Tutor, PC Desktteam, PC Outline, Procomm, DOS utilities, file utilities, hard disk utilities, backup utilities, graphics utilities, dozens of games and adventures, and much, much more. New US imports every month. 10 disk Startrite pack only £25.00, 5 disk compilation sets only £12.00, all others only £3.00 per disk.

SEND SAE for FREE 'Shareware News and Catalogue'.
NO MEMBERSHIP FEES!
Overseas enquiries welcome. (125)

PC-STAR
P.O. Box 164, Cardiff CF5 3YB

★ NEWS FLASH TO ALL READERS ★

SUMMER MADNESS

WEATHER FORECAST - AUTUMN & WINTER
AS TEMPERATURES FALL SO DO OUR PRICES

Super value discs for sale now. Just take a look at these incredible prices.

5 1/4" d/s d/d discs with free plastic case	£6.00
3 1/2" d/s d/d discs with free plastic cases	£14.50
5 1/4" Lockable disc boxes (holds 100)	£8.75
3 1/2" Lockable disc boxes (holds 80)	£8.75

We offer you a wonderful service all because you come first. All prices inc. VAT & P.P.

These discs are exceptional high quality and are used throughout the industry.

Phone **Me NOW** **M. Wood Discs** Telephone: **0952 590156**
27 Burford, Brookside, Telford TF3 1LQ (454)

Coming soon
MIDI Interface

ESCAPE Software

And Software.
Please write
for details

★★★ QL - Autumn P.C.W. Special Offer - QL ★★★

QL Education Pack: The three best educational programs for the QL!! QL Spelling Tutor, QL Maths Tutor and QL Revisor. **Only £37.95**

QL Spelling Tutor: A unique program for teaching spelling. Use built-in vocabulary (3500+ words) or your own word lists. Includes Anagram, Hangman and Word-Search. **£14.95**

QL Maths Tutor: Teaches basic Arithmetical, Geometrical and Logical concepts. Includes Nim and Hi-Lo games. **£14.95**

QL Revisor (Digitrix): Create your own multiple choice tests!! "Justifiably described... as an indispensable educational aid" QL World Feb 1987. **£14.95**

(QL Spelling Tutor and QL Maths Tutor were compiled with Q_Liberator)

Send cheques or P.O.s to:

ESCAPE Software (Dept. PCW)

2 Henley Road, Ilford, Essex IG1 2TT
Tel: 01-478 8281 (306)

VIKING COMPUTER SYSTEMS

Commodore	Price	Most software in the Amiga catalogue at approx 10% off—Phone for details	PC1640 SD CM	619.00
A500	454.45		PC1640 DD CM	719.00
A500 Package	474.00		PC1640 SD ECD	779.00
A500 DTP Package	739.00		PC1640 DD ECD	869.00
RGBA Monitor	345.00		PC1640 32Meg SD MM	899.00
Modulator	20.15		PC1640 32Meg DD MM	999.00
Atari			PC1640 32Meg SD CM	999.00
520STM	209.00	3.5 inch drive — 1Meg	PC1640 32Meg DD CM	1099.00
520STM 1/2 Meg Drive	279.99	Hard drive — 20Meg	PC1640 32Meg SD ECD	1159.00
As above, with mono monitor	379.99	Mono monitor	PC1640 32Meg DD ECD	1259.00
520STM 1Meg Drive	369.00	Colour monitor	PC1512 SD MM	389.00
As above, with mono monitor	399.99	ST printer	PC1512 DD MM	479.00
520STFM	259.99	Centronics PP8 laser printer	PC1512 DD CM	629.00
1040STF	449.99	(£200 off)	PC1512 32Meg SD MM	799.00
1040STF Mono	549.99	Amstrad		
3.5 inch drive — 1/2 Meg	119.95	PC1640 SD MM		
		PC1640 DD MM		

Also, we are the SOLE appointed suppliers to the public for Electric Software titles in Kent and the SE of England. (Sounds quite impressive does it not?!!)

PC1512 32Meg SD CM 899.00 PC1512 32Meg DD MM 899.00 PC1512 32Meg DD CM 999.00

PC1512: DD and 32Meg for the price (or less than) of SD and 20Meg!!

PC1512s ALL (except 10/20HD versions) come with Migent Ability, The Dam Busters, PSI-5 Trading Company, Bruce Lee and Tag Wrestling)

PCW8256 385.00 PCW8512 479.00 PCW9512 479.00

A massive selection of software, all below retail prices! eg: CP/M Cardbox only £45.95 (+VAT)

Prices are subject to change. All exclude VAT & p.&p. Special deal on p.&p. with larger items. (476)

Chancery House, Effington Street, Ramsgate, Kent CT11 9AT

Athene Consultants

33 Holly Grove,
Fareham, Hants PO16 7UP
Tel: 0329 282083

ALL DISCS SUPPLIED WITH LABELS AND LIFETIME GUARANTEE

Disc manufacturer Memorex

Description	Price
3-5 DS/DD 10 discs	£11.50 inc.
3-5 SS/DD 10 discs	£10.95 inc.
Storage Box (holds 10 discs)	£1.30 inc.
Popular Computing Weekly Special Offer only	
1 free disc box worth £1.30 with ten discs	
Quantity Discount starts at 50 discs	
3-5 DS/DD 50 discs	ONLY £52.90 inc. (92p each + VAT)
3-5 SS/DD 50 discs	ONLY £49.90 inc. (87p each + VAT)
3-5 DD 100 discs	£100. 3-5 SS/DD 100 £94.30

Despatch by 1st class post

Remember prices include VAT, postage and labels. All discs by top manufacturers with a Lifetime Guarantee. PLUS a 14 Day Money Back Guarantee.

QL Turboquill described as "Absolutely Essential" by QL World now has even faster version, QL Turboquill + for expanded memories QLS only, QL Turboquill + only £13.50 please state mdv or 3-5 inch disc & quill version.

To take advantage of these very low prices, send cheque/P.O. to:

Athene Consultants

Dept (POP), 33 Holly Grove,
Fareham, Hants PO16 7UP
Tel: 0329 282083
Prestel MBX 329282083

CALL FOR THE LOWEST
PRICES FOR QUANTITY IN U.K. (414)

Computer Centre STar U.K. Computer Centre

COTTONHOUSE, 493 UNION ST, ABERDEEN, SCOTLAND AB1 20B.
TEL: (0224) 581 858. ALL ENQUIRIES PLEASE PHONE CARY EXT 28

**ATARI 520 STFM WITH PSU, MOUSE, MODULATOR,
FREE P.D. SOFTWARE AND 1 YEARS SUBSCRIPTION
TO STar U.K. - ONLY £289.95**

**MEGA ST's PHONE FOR BEST PRICES IN U.K. -
GUARANTEED!!!**

**WE STOCK MOST ST PRODUCTS - AT BEST PRICES!
WITH ALL ST MACHINES PRO COPY ONLY £15.00**

* HARD DISK DRIVES *

* ATARI MONITORS *

* MEGA ST2, MEGA ST4, 1040STF, *

**PUBLISHING PARTNER - ONLY £124.95!!
PRO COPY ST Ver 1.41 NOW ONLY £27!!**

FUJI MF1DD Disks - Boxed in 10's with labels - Now only £22.95
Sony MF1DD Disks - Boxed in 10's with labels - Now only £19.95
All disks are branded with lifetime guarantees

For ALL your ST needs - Look no further!

ALL Public Domain software only £1.

We have over 100 disks of excellent quality

And all at only £1 each - Why pay more?

Send S.A.E. for P.D. list & Info sheet!

REMEMBER OUR GREAT NEWSLETTER

FOR SALE

Have you warned the neighbours you're getting a MASTER SYSTEM



For just £99.95 you get

- ★ The games machine
- ★ 2 Sega control pads
- ★ A power pack including a 3 pin plug
- ★ A T.V. aerial switcher box
- ★ A free built-in mystery game for you to find

ISM

P. & P. Free in U.K.

Make cheque or postal order payable to ISM and send to:

ISM, 1 RUSSLEY GREEN, WOKINGHAM, BERKSHIRE RG11 1BR

Sega Cards	£14.95
My Hero	£14.95
Ghost House	£14.95
Transbot	£14.95
Super Tennis	£14.95
F-16 Fighting Falcon	£14.95
Teddy Boy	£14.95
Mega Cartridges	£19.95
Action Fighters	£19.95
Choplifter	£19.95
Black Belt	£19.95
Pro Wrestling	£19.95
Shooting Gallery	£19.95
Wonder Boy	£19.95
Quartet	£19.95
Fantasezone	£19.95
Great Golf	£19.95
World Soccer	£19.95
Gangster Town	£19.95
Zillion	£19.95
Enduro Racer	£19.95
World Grand Prix	£19.95
Secret Command	£19.95
Alex Kidd in	£19.95
Mirrical World	£19.95
Two-Mega Cartridges	£24.95
Space Harrier	£24.95
Enduro Racer	£24.95
Rocky	£24.95
Outrun	£24.95
Missial Defence	£24.95

The new Sega Master System games console puts an arcade into your home.

Working from either card or cartridge the amazing games give screen after screen of almost arcade quality graphics. These machines will be in short supply and much sought after so ISM are giving you the chance to beat the rush and be the first in your neighbourhood to own one of these remarkable systems.

There is a terrific range of games available and some almost unbelievable peripherals like the Light Phaser and 3D glasses!!



**Don't miss out,
but warn your neighbours.**

With your system you will receive a 10% discount voucher against your next software purchase, and automatically be enrolled in the ISM—Sega club, which will keep you updated with future developments.

FORM FINDER RACE RATING SYSTEM

Rates, Races & Seconds using information from the racecard appearing in your daily paper. No updating of data required, systems lasts virtually for ever. Can be used for National Hunt and Flat racing all year round.

Saturday 5th September 1987, 14 races to rate,

8 WINNERS CLEARLY RATES.

Actual results: W 7/1	W 13/8
W 4/1	W 6/4
W 5/2	W 11/8
W 2/1	W 8/11
2nd 2/1	(Five unplaced)

Non BBC/Electron owners can produce the system to use independently of their micro, ratings produced are exactly the same, but if preferred the method can be converted into programme form.

BBC/Electron owners can purchase this system in ready made programme form.

BBC/Electron Cassette..... £15.00
or Rating System..... £15.00

Also available

FORM FINDER II Fixed Odds/Pool Forecaster

Requires no updating of data; can be used in any league; Australian, Vauxhall/Opel, British etc.

Type in details from the fixtures list appearing in your daily paper for forecasts of Homes, Away, Score and No-Score draws of any match displayed in seconds.

BBC/Electron Cassette..... £15.00

All orders/enquiries to:

ALLAN DATA (PC5),

1 Lorn Road, Dunbeg, Connel, Argyll PA37 1QG.

All orders despatched by return (Others—S.A.E. for details)

Telephone 0631 62923

(463)

RAMSOFT COMPUTER SUPERDEALS

AMIGA 500: with the following included FREE!

**Only
£495.95**

TV modulator, mouse, mouse mat, Deluxe Paint, 10 public domain discs with graphics, sound & utilities, Amiga book, game and delivery.

ATARI 520STFM: with the following included FREE!

**Only
£295.95**

Mouse, 6 discs, including graphic & sound demos, utilities, CP/M Emulator, and a choice between either FAST Basic or GFA Basic (state which) and delivery.

ATARI 1040STF: with the above items FREE!

Only £495.95

(again please state whether you want GFA or FAST Basic)

ATARI ST QUALITY BOOKS FROM ABACUS

Peeks & Pokes	£12.85
Basic Training Guide	£12.85
The ST for beginners	£12.85
Tricks & Tips	£14.85
Graphics & Sound	£14.85
Intro to MIDI Programming	£14.85
GEM Reference Guide	£14.85
Machine Language	£14.85
3-D Graphics	£16.85
Disc Drives - Inside & Out	£16.85

ACCESS HOTLINE 0706 43519

Send Cheque/POs or ACCESS number to RAMSOFT (Dept PCW), 24 Bankfield Lane, Norden, Rochdale, Lancashire OL11 5RJ

(478)

FOR SALE

ATARI 520 STFM NOW IN STOCK FOR NEW PRICE ONLY £279.95

Includes mouse controller, manual, language disc and starter pack

	RRP	OUR
Atari 1040 ST	£499.95	£369.95
Atari 1040 ST + SM125 mono monitor	£599.95	£469.95
Atari 520 STFM	£299.95	£279.95
Atari Mega ST 2 + SM125 mono monitor	£999.95	£894.95
Mega ST4 + SM125 mono monitor	£1205.95	£1149.95
Atari 12" medium res colour monitor	£399.99	£369.95
Triangle 1 meg drive	£159.95	£139.95
Cumana 1 meg drive	£159.95	£144.85

ST SOFTWARE AT GIVEAWAY PRICES

Flight Sim. II.	£39.95	Centinel	£16.95
Knight Hawk	£16.95	Degas Elite	£24.95
Arctic Fox	£16.95	Chess Master 2000	£19.95
Music Construction set	£19.95	Sky Fox	£14.95
Bards Tale	£19.95	Art Director	£39.95
Gato	£24.95	Fantasy III	£19.95
Eagles Nest	£16.95	Barbarian	£19.95
Flip Side	£6.95	Mud Pies	£6.95

BLANK DISCS

10	20	50	100
£12.50	£23.50	£54.95	£105.00

Trade enquiries welcome

Lockable disc boxes 3.5" holds 80£9.95

Spend over £50 on Software and get a Free Calculator

AMIGA A500 NOW IN STOCK FOR ONLY £528.95

AMIGA HARDWARE

	RRP	OUR
Amiga A500 + 1081 colour monitor	£918.85	£879.95
Amiga 200	£1259.25	£1094.95
XT Bridge Card (Amiga 2000)	£573.85	£499.94
Internal 1 Meg Disc Drive (Amiga 2000)	£228.85	£199.95
1010 External Disc Drive	£286.85	£259.95
Amiga Internal 1 Meg Upgrade	£113.85	£99.95
Triangle 1 Meg Disc Drive	—	£139.95
Cumana 1 Meg Disc Drive	—	£139.95

AMIGA SOFTWARE

Archon/tonl.	£17.95	Bards Tale	£19.95
Flight Sim II.	£39.95	Chess Master 2000	£19.95
Deluxe Paint II	£69.95	Earl Weaver Baseball	£24.95
Marble Madness	£16.95	Seven Cities of Gold	£12.95
Instant Music	£19.95	Mean 18 Golf	£24.95
Sinbad	£34.95	Deep Space	£24.95
Super Huey	£16.95	Area/Bratticus	£29.95

More Software than we can show please ring.

Amiga A500 comes complete with modulator, 10 public domain discs, Karate Kidd II and mouse mats

We are a Commodore appointed dealer
All trade enquiries welcome

(360)

SOUND N VISION

11 Silk St, Leigh, Lancs WN7 1AW.

Phone now for details — Tel: (0942) 673689

Cheques and P/Orders payable to: Sound N Vision P.&P./VAT INCLUDED

Visitors welcome in showroom. Send S.A.E. for price list.



9" VDU OR MONITOR ideal to work with computer or video camera uses Philips black and white tube ref M24/306W. Which tube is implosion and X-Ray radiation protected. VDU is brand new and has a time base and EHT circuitry. Requires only a 16V dc supply to set it going. It's made up in a lacquered metal framework but has open sides so should be cased. The VDU comes complete with circuit diagram and has our six months guarantee. Offered at a lot less than some firms are asking for the tube alone, only £16 plus £5 post and insurance.

COMPACT FLOPPY DISC DRIVE EME-101

The EME-101 drives a 3" disc of the new standard which despite its small size provides a capacity of 500k per disc, which is equivalent to the 3½" and 5¼" discs. We supply the Operators Manual and other information showing how to use this with popular computers: BBC, Spectrum, Amstrad etc. All at a special snip price of £27.50 including post and VAT. Data available separately £2, refundable if you purchase the drive.

COMPUTERS

COMPUTERS the Acorn "Electron" as used in many schools for games and serious jobs. Works into colour or Black and White TV. Proper price was £199, our price, tested and working £45 + £3 post, tested but slightly faulty £36 + £3 post. All are complete with mains P.S.U., 300 page handbook, TV lead, and starter cassette. Full range of Software also in stock at very low prices. Sample pack of 5 £4.

£1 BAKERS DOZEN PARCELS

There's over 400 packs in our Baker's Dozen range and you become entitled to a free gift with each dozen packs. A classified list of these packs and our latest "News Letter" will be enclosed with your goods, and you will automatically receive our next news letters.



TRADE ENQUIRIES INVITED

J & N BULL ELECTRICAL

DEPT. P.C., 250 PORTLAND ROAD, HOVE, SUSSEX BN3 5QT

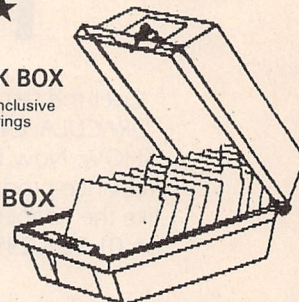
MAIL ORDER TERMS: CASH, P.O. or cheque with order. Orders under £20 add £1 service charge. Monthly account orders accepted from schools and public companies (min. £20). Access & B/c card orders accepted. Phone Brighton (0273) 734648 or 203500.



No quibble guarantee

★ EXCEPTIONAL VALUE ★

25 5.25" DS-DD DISKS
plus
100 CAPACITY LOCKABLE DISK BOX
FOR ONLY £17.60 VAT & Delivery inclusive
All above inc. envelopes, label sets and hub rings
or
50 5.25" DS-DD DISKS
plus
100 CAPACITY LOCKABLE BOX
FOR ONLY £27.10
VAT & Delivery inclusive



Cheques or PO's to:



Manor Court Supplies Ltd

Glen Celyn House, Penybont, Llandrindod Wells,
Powys LD1 5SY. Telephone: 0597 87 784

● Educational and HMG orders accepted ● Trade enquiries



(325)

YOU AND YOUR PCW

Perfect partners in a money making home enterprise. **Write or phone NOW for free details of this complete business plan.**

POINT ONE PUBLISHING Transforming Ideas Into Money

Box 34, St Bees, Cumbria CA27 0BN

Tel: 0946 822242

(475)

STANTON MICROS LTD

PO Box 285, Harrow, Middlesex HA2 7JZ
Atari ST mail order service: Tel: 01-861 2261

Atari Mega ST 4 megabyte + SM125 mono monitor.....	£1180.00
Atari Mega ST 4 megabyte keyboard + free software.....	£1089.00
Atari Mega ST 2 megabyte + SM125 mono monitor.....	£899.00
Atari Mega ST 2 megabyte keyboard + free software.....	£819.00
1040STF keyboard (includes mouse & software).....	£439.95
1040STF + built-in television modulator + software.....	£589.00
1040STF + SM125 high res. mono monitor + software.....	£555.00
1040STF + Philips CM8533 colour monitor + software.....	£729.95
520STFM (includes mouse, software, modulator + drive).....	£269.00
520STFM as above but with 1 megabyte of ram only.....	£369.00
520STFM + SM125 mono monitor + free software.....	£405.00
520STFM + Philips CM8533 med/res colour monitor.....	£545.00
520STFM keyboard, built-in modulator, 1 megabyte ram.....	£329.00

Various Atari 520STFM Summer Pack Special Offers call for details:

Drives: Cumana 1mb £139.95.....	2mb £229.95.....	Atari 1mb £179.95
Atari ST SH204 Hard drives: 20mb £550.00.....	40mb £1100.00	
Supra 20mb hard drive, with 12 partitions and auto boot.....	£605.95	
Atari SM125 high resolution mono monitor.....	£129.95	
Philips CM8833 medium resolution colour monitor + lead.....	£289.95	
Citizen 1200 dot matrix printer 80 col. + NLO. excl.....	£169.95	
Epson LX800 150cps including tractor feeder.....	£299.95	

Call for price: Epson/Citizen/Juki/Neo/Oki & Zorex printers

WS2000 manual dial, 300, 1200, 1200/75 modem + lead.....	£119.95
WS4000 auto dial + answer, 300, 1200, 1200/75 modem.....	£169.95
MP 1203. telephone & 300-11200 baud modem in one.....	£109.95
MP 303. telephone and 300 baud modem in one.....	£60.00

We sell business software, children's education programs & games.
For price enquiries & orders call 01-861 2261 24hr service. Postage
STs £5, drives/modems £4, software/cables/discs £2.50

NAME.....

ADDRESS.....

TEL:..... ITEMS ORDERED.....

Cheques/POs payable to: STANTON MICROS LIMITED

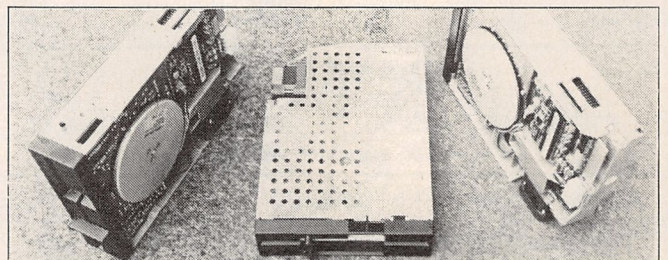
(474)

Available on stand
3040 at PCW Show

**80 TRACK /
DS DD 5¼"**

HALF HEIGHT DISC DRIVES

Made by a well known quality PC manufacturer but surplus to requirements due to the need for 40 track IBM compatibility. Uncased bare drive – £60. Drives in cream metal cases – £70. Cased drive with connecting leads to suit BBC micro – £74.95.



Money back if not satisfied and returned undamaged within 7 days. Callers welcome Mon-Fri 9-5.

Pinboard Computers Ltd,

Unit 9, Bondor Business Centre,
London Rd, Baldock,
Herts SG7 6NG
Tel: (0462) 894410

Prices include VAT, packing
and parcel post.



(477)

PROGRAMMERS

Over the last year the ZEN ROOM has produced some of Europe's top games, like TAU CETI, DRACULA, CYBORG, ACADEMY, DEATH OR GLORY, BALLBREAKER and THE ROCKY HORROR SHOW. Now Britain's most innovative software development team are looking for experienced freelance programmers to join them. If you have just written a game or are about to and would like the financial and programming back-up the ZEN ROOM can offer contact Michael Hodges on 01-985 2391 or write to the ZEN ROOM, Unit 7D, Kings Yard, Carpenters Road, London E15.

THE ZEN ROOM

A DIVISION OF CRL GROUP PLC



ATARI 520STFM including extras, 4 months old £260. Commodore MPS801 printer, plus paper £65. CRM 64 discs for sale, Pawn, Fourth Protocol, Lor, Hobbit, Music System, £6 each. Tel: Congleton 271848.

FOR CBM64. Machine code routines, including, smooth scrolling, sprite splitters, border disablers and much more. Source code included for most assemblers. Send S.A.E. for details. 5 Carrswood Road, Brooklands, Manchester M23 9HX

FOR ATARI ST: SM125 Mono Monitor (new) £80. GFA Basic £30. GFA Draft £50. FS11 £22. First Word Plus £45. 15 PAGE6 discs £30. 5 'Faster' discs £20. Tel: 0822 852796.

ST Public Domain Software from only £1.50 per disc for list. Send a stamp to: Softfill, 55 Highfield Avenue, Waterlooville, Hampshire PO7 7PY.

AMIGA USERS contact the Klinka Krew for buying, selling or swapping latest software. 45 Downsfield, Ingsbridge, Hull.

FOR SALE. Used Apricot PC computer with Brother HR-15 Daisy wheel printer. In good condition. Price £700, collected. Tel: 01-801 9631.

SPECTRUM OWNERS use 'grid-searcher' to tackle wordsearch competition. Input grid contents, then programme converts any line of letters into a single horizontal line reading from left to right. Send £1.95 to: J. Guest, 101 Bishopwood, Woking, Surrey GU21 3QD.

ICLOPD keyboard, monitor, modem plus xchange software, £350. No time wasters. Tel: 01-952 9104.

CPC 464 with colour monitor, lots of games and magazines, £200 o.n.o. Tel: (0205) 51402.

MICROVITEC 1451 medium resolution colour monitor, only 2 weeks previous use from new, excellent condition, gift at £200. Tel: 01-876 9531. Evenings.

PACE 5¼" disc drive with Amstrad CPC Interface & 60 discs, £140. Tel: (01) 302 9984.

COMMODORE 128, 1570 disc drive, datasette, joystick, freeze machine cartridge. Loads of original disc and tape software titles CPIM etc. Disc box. £350. Tel: Russell 01-777 5155. Evenings.

COMPLETE ATARI starter kit, Atari 520 STFM monochrome monitor, Atari 1 meg disc drive, Star NL10 printer. Lattice C compiler, 3-04 version plus desk, books ad discs. Less than three months old. £800 o.n.o. Tel: 01-837 6063 after 7pm.

MITSUBISHI F48 MSX COMPUTER. HX P550 printer, Sanyo D101 data recorder, tapes, manuals, books – £180. Tel: Rayleigh (0268) 776586. Anytime.

PUBLISHING PARTNER ½ price – Atari ST £275. Tel: 0920 67519.

MITSUBISHI F48 MSX COMPUTER. HX P550 printer, Sanyo D101 data recorder, tapes, manuals, books – £180. Tel: Rayleigh (0268) 776586. Anytime.

Atari 800 XL / 130 XE Essential Utilities

Transdisk Version 3.0

The most powerful tape to disc system for the Atari now made even better. Transfers commercial, machine code, "boot" cassette games or any other software to disc. Single, multi-stage and now even non-standard format tapes present no problem to Transdisk. Plus, enjoy the convenience of loading and running your newly transferred software from an autorun disc menu. No other tape to disc utility for the Atari is as powerful or successful as this! £19.95 inc. Supplied on disc with instructions.

The Freezer!

An amazing new utility for the Atari! "Freezer" programs while they are RUNNING on your computer. The Freezer then takes over control and allows you to make a back-up copy of the frozen program. The back-up copy will load, and restart from the frozen point, on ANY Atari XL/XE computer, independent of The Freezer! Freezes disc OR tape programs even those that are heavily protected! Easy to use - hit one key to freeze the program in memory then insert a blank disc and hit another key to save it - that's it! £19.95 inc.

Send an S.A.E. or phone for more details of these utilities.

Special offer order both programmes for £35.00

Make Cheque or P.O. payable to DIGICOMM and send your order to:

DIGICOMM

170 Bradwell Common Boulevard, Milton Keynes, Bucks MK13 8BG. Tel: 0908 663708. (121)

QL ZITASOFT WARE

SIDEWINDER. NEW screen dump for Epson RX80 and compatibles. Has other FNs over an ordinary screen dump, eg create your own screens, draw, plot, text insertion, partial screen dump. Dump upright/sideways. Make your own 20 foot banners, mass produce mdv or address labels, letterheads etc. Proportional/squashed/stretched dumps. Fast rough or slow quality dumps. SEE REVIEW QL WORLD SEPT 87. "Absolutely top marks for a superb program".

TOOLCHEST toolkit to read and write mdv sectors etc. About 40 FNs with hex ASCII display formatting Write your own doctor, mem or ED prog in basic easily or use the customisable editor provided.

LOCKSMITH a VERY fast MDV copier with 3 copiers in one. Deals with more than just "most software", it "keys" for all, no other program can claim this. No more corrupt master mdvs with Locksmith around.

4MATTER copies mdv to file with as much success as most MDV only clones. The best available.

SHRIVEL Deluxe memory shrink program installs selectable 128/192/256K etc shrink on any basic boot file.

SIDEWINDER = £10. **LOCKSMITH** = £10. **4MATTER** + **LOCKSMITH** = £18. **SHRIVEL** = £5. **TOOLCHEST** = £8. Cheques not readily cashable on GB acc (eg Eurocheque) please add £2 to cover conversion. Prices inc. P&P. to Europe. Cheques, PO's to:

Steve Jones, ZITASOFT, 93 FOXBOURNE ROAD, LONDON SW17 9EN.

Other suppliers Care Electronics/Curry Computer U.S.A. (451)

FLOPPYSHOP ST USER GROUP and public domain library

We're an independent user group set up to support the ST community. For £5 annually you have access to one of the largest software libraries in Britain along with free subscription to a club magazine. The current issue is available as part of our introduction pack which you can get free by sending a S.A.E. to the address below. We charge only £3.50 per disc including P&P.

Floppyshop ST (415)
50 Stewart Crescent, Northfield, Aberdeen

AMIGA

PUBLIC DOMAIN SOFTWARE

We have the very latest Fish # numbers #1 to #88 and Amicus numbers #1 to #22 disks in stock. For full details of programme content PLUS Tutorial "PD Without Tears" PLUS the JUMPDISK Magsoon PLUS a collection of programmes and articles from previous issues of JUMPDISK. Please send a £3.50 cheque/PO for the "JUMPDISK SAMPLER". We will send a copy by return.

George Thompson Services Ltd.
Old Reigate Road, Betchworth, Surrey RH3 7DR
Tel: 073-784 4675 (291)

ENGINES OF CREATION

£11.20 from **Longevity Books**, 20
Westowan, Portlinton, Truro, Cornwall
TR4 8AX. Send now! (467)

COLOUR RIBBONS FOR MOST PRINTERS

(not for DMP 1,2,3)

Also for DMP 4 available
Trade enquiries welcome.

Pearldeck Trading Ltd,
FREEPOST, Billingford,
DISS, Norfolk IP21 4BR (469)

LABELS

Self Adhesive Disk & Cassette Labels

DISK LABELS - 3" & 3 1/2" Disk labels, 71 x 69 mm, on tractor feed backing for computer overprinting. White: 500 - £15.55, 1000 - £22.05, 2000 - £25.69. Tinted labels in - Blue, Pink, Grey, Cream, Yellow, Orange, Green: 500 - £21.35, 1000 - £31.05, 2000 - £43.63. 5 1/4" Disk, 95 x 36 mm, White: 500 - £12.75, 1000 - £17.75, 2000 - £20.56. Tints as above: 500 - £15.20, 1000 - £24.65, 2000 - £34.36.

CASSETTE LABELS - On tractor feed backing. Rolls of 500 labels, White - £14.66, Tinted - £16.90. A4 sheets, 12 labels per sheet, 100 labels - £3.50, 200 - £6.00, 1000 - £21.85. All prices are inclusive of VAT & carriage.

We are specialist computer label makers and can provide printed labels in 24/48 hrs. For price list and sample brochure of our full range of self adhesive micro computer labels plus details of quantity discounts
✉ **Sittingbourne (0795) 28425 (24 hrs)**

**Industrial
Process**

Unit A4
Smeed-Dean
Centre
Sittingbourne
Kent ME10 3RN

Self Adhesive Labels - **SUPERFAST**

ATARI ST PUBLIC DOMAIN

Why reinvent the wheel? We have a large selection of languages, demo's, utilities, comm's and games etc, available. A stamp for our list will save you hours of frustration.

Discs from £2.50

MCSOFT

9 Abington Gardens, Bath,
Avon BA2 2UY (178)

AMSTRAD PC1512 double disc drive, colour monitor with modem and software. Excellent condition, £750 o.n.o. Tel: Sheffield (0742) 662005. Evenings.

BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
20	7.50	7.70	7.90	8.70
50	16.00	16.20	16.90	18.50
100	29.00	30.00	31.00	35.00

Fully Inclusive (C.O.D. £1 extra)

DISKS

10 5 1/4 DS/DD
£6.00 inc. case

10 3 1/2" SS/DD
£11 inc. case

10 MAXELL 3" CF2
£20

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	£43.00
DMX 80 PRINTER	£150.00
RS232	£30.00
PASCAL ROM	£30.00
SPECULATOR ROM	£30.00
1 mb. DISK DRIVE & INTERFACE	£160
1 mb. DISK DRIVE & INTERFACE	£160

All the above prices are fully inclusive. We stock the entire Memotech Range. Order/Enquiries to:

UK HOME COMPUTERS
82 CHURCHWARD AVE, SWINDON,
WILTS SN2 1NH
24-hr Phone Service 0793 695034

RIBBONS

ALADDINK

FABRIC RIBBON CASSETTE RE-INKING

Trial offer: £1 per ribbon

Post used cassettes with payment to:

ALADDINK (Dept PC),
4 HURKUR CRESCENT, EYEMOUTH,
BERKSHIRE TD14 5AP
Tel: 08907 50965 (338)

SERVICES

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.

Our computer repair workshop has been an **OFFICIAL** Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.

Send your faulty computer **DIRECT**

SPECTRUM	£18.75 inc parts
ZX81	£11.50 inc parts
16K RAM	£9.95 inc parts
MICRODRIVE	£15.95 inc parts
INTERFACE 1-11	£18.75 inc parts

CALL OR SEND WITH CHEQUE OR P.O.

T.V. SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD, CAMBRIDGE CB4 3NP
Tel: 0223 311371 (28TV)

HARDSOFT · INTERNATIONAL

1A The Square, Sawbridgeworth, Herts. 0279 726488/726406

Office automation at a price that is affordable.
Lease an Amstrad PC1640 DD-MD + Epson printer + wordprocessor + spreadsheet, for under £7.00 per week.

As an approved dealer for Amstrad, Epson, Seikosha, Star, Olivetti etc., we offer free unbiased advice on various machines and software.

Our sales team can demonstrate any machine anywhere in Britain and will advise you on which of our eight different leases will suit your needs best. **CONTACT US TODAY FOR A FREE QUOTATION**

NATIONWIDE NEXT DAY DELIVERY ★ CONSUMABLES ★ FREE TAX & FINANCIAL GUIDANCE ★ CONTINUOUS STATIONERY ★ 24 hr MAINTENANCE CONTRACTS ★

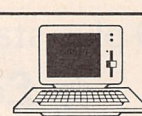
PCW 9512 in stock £499 + VAT (including FREE maintenance)

SPECIAL OFFER - ATARI STFM £274.00

AMIGA A500 £439.00 inc. VAT & P.P. modulator + software (460)

COMPUTER REPAIRS Fixed Super Low Prices!

Inclusive of parts, labour and VAT



**FIRST AID
FOR
TECHNOLOGY**

1 week turnaround

Free collections/delivery available for local area

★ SPECIAL OFFERS ★

SPECTRUMS	£14 inc. + Free Game
C64	£22 inc. + Free Game
C16	£18 inc.
VIC20, C+4	£22 inc.
BBC	£32 inc.
ELECTRON	£19 inc.
AMSTRAD 464	£32 inc. + Free Game
SPECTRUM 128	£16 inc.
C64 P.S.U. FOR SALE	£20 inc.

Please enclose payment with item - 3 month warranty on repair
Please enclose advert with repair

W.T.S. ELECTRONICS (182)

5-9 Portland Road, Luton, Beds LU4 8AT. Tel: 0582 458375. Telex: 265871

EAST LONDON MICRO SERVICE CENTRE

Spectrum, Commodore, Amstrad, Atari, MSX plus peripherals.

Turnaround typical of 2-5 days.

Three months warranty guaranteed.

Postal repairs undertaken.

Computer IC's components sold.

Budget games, software and accessories sold. Mail order welcome. Trade enquiries welcome.

Open 9am-8pm Mon.-Sat

SAN ELECTRONICS

63 Plashet Grove, East Ham
London E6 1AD

Tel: 01-472 4871

Four minutes walk from Upton Park Tube Station, (358)

400/800 **LOOK** NOW

XL/LE **LOOK** ST

ATARI OWNERS

Are you having difficulty finding suitable software. If so, then look no further. We have available for both hire and purchase one of the largest selections of both the UK and American titles to choose from. Games and Utilities for all ages. Hardware and add-on utilities at discount prices and special deals regularly being offered. If you would like further information please send a large s.a.e. to:-

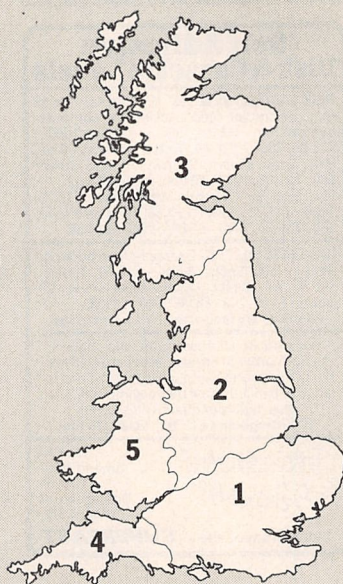
CHARWOOD PRODUCTS AND GAMES
30A Warwick Avenue, Quorn, Leicestershire LE12 8HD
Tel: 0509 412604 (465)

DUPLICATION

We now OFFER THE FOLLOWING: data/audio cassette duplication for most computers; Disc duplication (£5.25); blanks; PHOTOCOPIED LABELS & INLAIS PRINTED, with your LOGO, or dot-matrix.

Price list from: **SSP,**
20 WestEnd, Loughton, Near Bicester,
Oxon OX6 0DF.
Tel: 0869 252831 (283)

M

CRO
SLE

1 THE SOUTH EAST

LONDON

DIGITAL SHADES LTD

✓ **Amiga 500**
Special offers

★ A500 plus starter kit & modulator

★ **£499** ★

▲ **Atari ST**
Special offers

★ Atari 520 STFM plus starter kit

★ **£260** ★

If you can't see the machine, peripheral, or software you want, then ring now for new low prices or send S.A.E. for mailing list.

(378)

Mail order hotline 01-471 7969

All prices include VAT

9 Selsdon Road, Upton Park, London E13 9BY

SOUTHEND-ON-SEA

ESTUARY
PERSONAL COMPUTERS

Commodore's Amiga A500 available NOW. Call for price.
Buy the Atari STFM at the new price – only £299 inc. VAT.

Software at discount prices.

Victoria Circus Shopping Centre
(escalator from railway station)
Southend on Sea

Tel: (0702) 614131

(289)

1 SOUTH
EAST

SOUTHEND

A.S. and T. Ltd.

Largest Atari St dealer in Essex

Tel: 0702 510151
Unit 32/33
Rutherford Close
Eastwood Industrial Estate
Leigh-on-Sea
Essex

(Progress Road/A127)

(388)

2 THE
MIDLANDS

NORTHAMPTON

A-Z COUNTY SUPPLIES

Large range of games and business software available at discounted prices.

MSX
ATARI ST
COMMODORE
SPECTRUM
AMSTRAD

Mail order enquiries welcome

174 Kettering Road
Northampton NN1 4BE
Tel: 0604 24380

(452)

DEALERS!

You can reach 40,000 readers for as little as £25 a week!
For more details phone Susannah on 01-834 1717

2 THE MIDLANDS AND NORTHERN ENGLAND

ASHBY DE LA ZOUCH

ASHCOM

Atari hardware

520 STFM, keyboard/mouse/0.5 meg drive.....	£259.95
1040 STF keyboard/mouse/1 meg drive.....	£439.95
1040 STF plus colour monitor.....	£799.95
SF 314 1 meg drive.....	£169.95

Commodore Amiga range

A500 4 + Offer Pack	£450.00
A1010 disc-drive.....	£249.95
3.5 inch discs DS/DD guaranteed (packed in 10s).....	£14.95

Amazing prices on peripherals and all software. All prices include VAT at 15% and P&P on UK mainland. For more information call us on (0530) 411485 or send SAE for full price list. To order send cheques/PO or Visa/Access details to the address below or phone with credit card.

ASHCOM

10 The Green, Ashby de la Zouch, Leicestershire LE6 5JU
(437)

LEICESTER

VISIT THE
**EAST MIDLAND'S
LEADING
ATARI DEALER**
FOR A FULL RANGE OF ATARI
AND ASSOCIATED PRODUCTS

3.5" DS/DD DISC'S
Guaranteed for Life



10 Discs + Library Box	£13.95
30 Discs + 40 cap. Lockable Disc Box	£39.95
30 Discs + 80 cap. Lockable Disc Box	£43.95

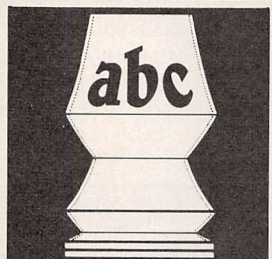
Visit our shop for greater discounts
on disc's

START
The ST
Quarterly Magazine with
FREE DISC **£12.95**



All prices include VAT and postage in the UK
Cheques & postal Orders made payable to: abc

abc 135 St. Leonards Road,
Leicester, LE2 3BZ



DEGAS ELITE
£24.95

**CHESSMASTER
2000**
£24.95

Just two great titles taken
from a vast range of software

**520
ST FM**
£279



(0533) 700190
(24hr Answerphone)
Norfolk (0328) 710316

CLEVELEYS

ELM COMPUTING

Amiga A500 - £469 + VAT
(Vouchers accepted)

Atari 520 STM - £269

Software for all machines at discount
including ST Amiga, MSX, BBC etc.

	RRP	Our Price
ie: MSX Milk Race.....	£1.99	£1.79
ST Roadrunner.....	£24.99	£19.95

Send S.A.E. stating interest to:
ELM COMPUTING, 3c York Avenue,
Cleveleys, Lancashire FY5 2UG
Tel: 0253 852882 (443)

STIRLING

TECH SUPPLIES

Ex-stock electronic
components, computers,
peripherals, word processors,
test equipment and office
equipment.

NO ORDER TOO SMALL
NO ORDER TOO LARGE

19i Winchester Avenue, Denny,
Stirlingshire FK6 6QE
Tel: 0324 825627

Open hours: 9am-4pm, 7.30pm-10.30pm (426)

LICHFIELD

COMPUTER WORKSHOP

34-36 Market Street, Lichfield
Staffordshire WS13 6LH
Tel: 0543 262976

AVAILABLE NOW!

Amstrad PC 1640 mono display	from £499 plus VAT
Amstrad PCW 8256 word processor	£299 plus VAT
Amstrad PCW 8512 word processor	£399 plus VAT
Amstrad 464 with green screen and software	£194.95
Amstrad 464 with colour screen and software	£294.95
Amstrad CF2 discs	£29.90 per box of 10

*Please contact Catherine
for further enquiries*

(441)

MANCHESTER/HINCKLEY

COMLEX

SPECIAL PRICES WITH THIS AD!

AMSTRAD SUMMER DEALS

Amstrad 1640 20Mb Tandem £999

Including twin floppy, Supercalc, Wordstar printer - £849; Colour version add £158; with Tandem 20 Meg hard card add £199. All prices + VAT - phone for others not listed.

AMSTRAD PC

1DD Mono.....	£379	20Mb Upgrade for Amstrad PC (fitted if required) £245	
2DD Mono.....	£479	Amstrad 1512 Mono (20Mb Tandem).....	
1DD Colour.....	£519	640K Memory.....	£649
2DD Colour.....	£619	Amstrad Colour 1512 (20Mb Tandem).....	£799
1640 20 meg ECD.....	£1099	640K Memory.....	£799
1640 DDEC.....	£839	Amstrad 128K memory upgrade.....	£29
1640D EDC.....	£749		

SUMMER SPECIALS

Tandem PCA20.....	£1349
Mini Scribe 30 Meg card.....	£275
Tandem 20 Meg upgrade.....	£225
Tandem 20 Meg business card.....	£225

PRINTERS

Epson LX800.....	£189
Star NL10.....	£195 inc. interface
Citizen 120D.....	£135

For further lists of printers and machines see PCW

ATARI

520STFM.....	£235	520STFM + Philips colour 8833.....	£459
520STM + mono monitor.....	£315	1040STF + mono.....	£399
		1040STF + Philips colour 8833.....	£624

COMMODORE

Amiga 500.....	£439	Amiga Bridge + 5 1/4.....	POA
Amiga 500 modulator.....	£25	PC Double Disk Drive.....	£799
Amiga I.....	£949	PC One Disk Drive 20Mb.....	£1099
Amiga II.....	£1049	AT 20Mb 1.2 Disk Drive 20Mb.....	£1775
Amiga 2000 1Mb.....	£1116		

GOVERNMENT AND EDUCATIONAL ORDERS WELCOME,
EXPORT ENQUIRIES WELCOME

STANDARD DELIVERY £5 AND NEXT DAY £9.50 — ADD 15% TO ORDER TOTAL
Comlex House, 28 Bradgate Road, Hinckley LE10 1LA
(0455) 635583. Manchester 061-976 3763

(342)

3 SCOTLAND

GLASGOW

GLASGOW COMPUTER CENTRE

Atari appointed dealer
and Service Centre
Specialists in Atari ST Computers

VIRGINIA GALLERIES

(1st FLOOR)

33 VIRGINIA STREET

GLASGOW G1 1TU

TEL: 041-552 1522 (136)

EDINBURGH

The AMIGA CENTRE SCOTLAND Commodore Business Centre Amiga Specialists since 1985

Amiga A500 and A2000 now available.
Technical and software support to our customers. Full range of AMIGA software and peripherals.

Send S.A.E. for our software catalogue

4 Hart Street Lane
Edinburgh EH1 3RN
Tel: 031-557 4242 (24 hrs.) (379)

AIRDRIE

J.C.S.

JOHN'S COMPUTER STORE

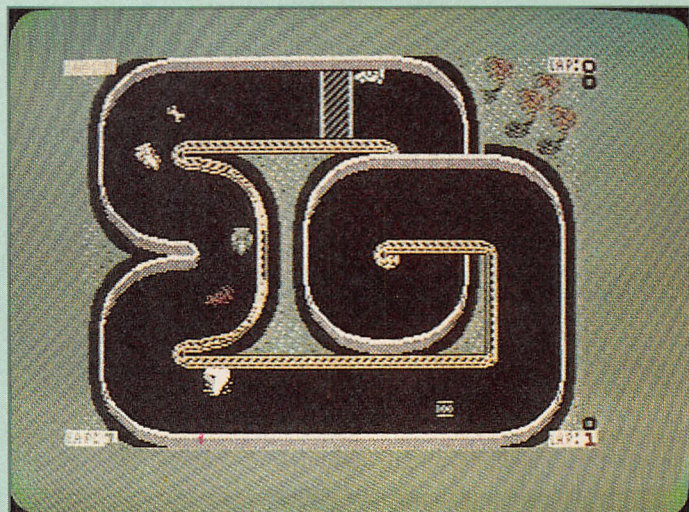
☆ Atari ST range
+ Amiga A500

☆ In Airdrie now —
Phone 0236 54260

Hardware and Software
all tried and tested

4 Graham Street, Airdrie,
Scotland ML6 9JP

Mind how you go round the hoola-hoops



My first reaction when I saw *Supersprint* loaded up was mild disbelief. Instead of the *Pole Position*-type game that I was expecting (that presents you with a view of the track from the driver's seat), what I got was an overhead view of a race track with a few tiny little car shapes on it.

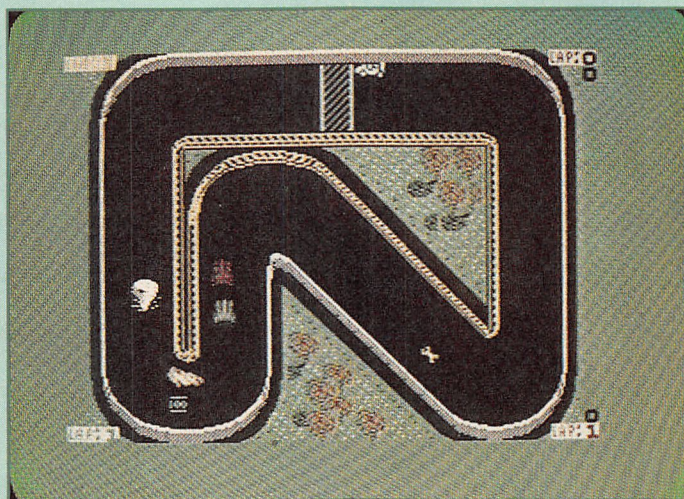
Not exactly state-of-the-art. But although the game might initially seem to be a bit unsophisticated it turns out to be surprisingly playable.

You are given a choice of eight tracks of varying difficulty. The simplest of these are basically straight stretches of road joined by a couple of bends, while the hardest ones look like a pile of hoola hoops. Once you've made your choice, a white flag waves and the computer controlled cars ('drones') zoom off around the nearest bend, leaving you wondering what's happening.

Controlling your car is simple; press 'fire' to accelerate, and choose two keys or joystick to

control your direction. There are no brakes, but as soon as you stop accelerating you'll find that you slow down pretty quickly. It takes a little bit of practice to get the hang of steering, and

unless you're moving very fast in which case you'll burst into flames. Fortunately you've got three replacement cars which are flown onto the course by helicopter, so all is not lost.



you ought to be careful about how fast you travel at first. If you hit the side of the track you should just bump to a halt,

Some of the tracks have underpasses, and you are driving blind as you go through these, so again you'll need a steady hand to keep your car on the track.

Better with two

After a few bumps into the side of the track and a couple of laps in the wrong direction, it occurred to me that it was all quite good fun. Like the recent comeback that the simple shoot 'em up has made, *Super Sprint* demonstrates that a game can be unsophisticated but still fun. But I should add that like a lot of sports based games, *Super Sprint* is much better when two people play it together.

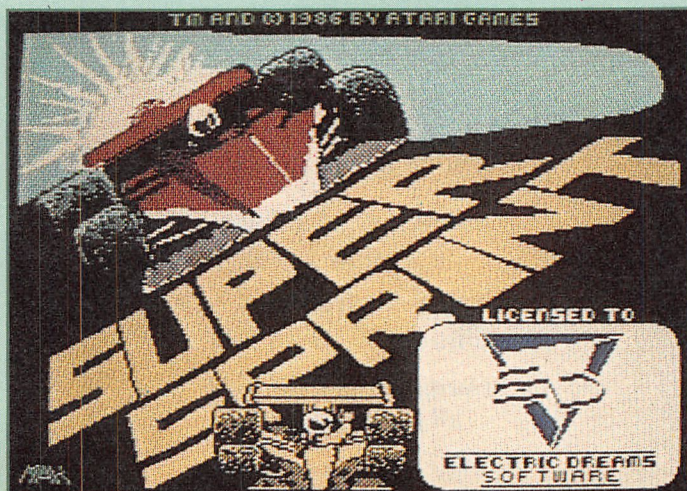
As you skid your way around

the various tracks you attempt to avoid a number of obstacles, such as oil slicks and puddles, and there is a tornado (which looks like a fingerprint) which smudges its way across the screen occasionally and blows you all over the place. There are also a number of golden spanners (these look like squashed frogs) which give you bonuses when you collect them. If you collect three or more of these then you gain additional custom car features, such as Turbo acceleration, traction, and a higher top speed, which give you a better chance of winning.

In some ways the overhead view of the track works better than the *Pole Position* type of game, since it gives you a clearer view of what's happening around you, and you're not likely to be surprised by a car appearing from behind you and sending you skidding out of control. On the other hand, it does mean that the size of the track is restricted by the size of the screen display, so the amount of variation in each track is similarly restricted.

But my only real doubt about the game is its price. Any game that costs £9.99 really ought to be pretty spectacular and/or original, and since *Super Sprint* is only another coin-op conversion I think Activision are pushing it a little here.

Cliff Joseph



Program *Super Sprint* **Type** Arcade **Machine** C64, Spectrum, Amstrad CPCs **Price** £9.99 **Supplier** Activision, 23 Pond Street, London NW3 2PN.

Your complete guide to all the software released this week

Amstrad CPCs



Program Motos Type Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program Game Set and Match Type Sports compilation **Price** £12.95 (£17.95) **Supplier** Ocean, 6 Central Street, Manchester M2 5NS.

Program Scrabble Deluxe Type Board game **Price** £15.95 on CPC6128 (disc only) **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX.

Program Saracen Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Program Flash Gordon Type Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program Beach Head II Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Program Xevious Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Program Flash Gordon Type Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program Bosconian Type Arcade **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Program Angleball Type Arcade **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4JH.

Atari ST

Program 3D Galax Type Arcade **Price** £19.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS.

Atari XL/XE

Program Dizzy Dice Type Fruit machine simulation **Price** £1.99 **Supplier** Players, Calleva Park, Aldermaston, Berks.

BBC B

Program Jet Pac Type Arcade **Price** £1.99 **Supplier** Ricochet, 8-10 Paul Street, London EC2A 4JH.

Commodore C16/Plus 4

Program Dizzy Dice Type Fruit machine simulation **Price** £1.99 **Supplier** Players, Calleva Park, Aldermaston, Berks.

Commodore 64

Program Hyberblob Type Arcade **Price** £2.99 **Supplier** Firebird, 64-76 New Oxford Street, London WC1A 1PS.

Program Anarchy Type Arcade **Price** £1.99 **Supplier** Rack-It, 8-10 Paul Street, London EC2A 4JH.

Program Games Set and Match Type Sports compilation **Price** £12.95 (£17.95) **Supplier** Ocean, 6 Central Street, Manchester M2 5NS.

Program Talledega Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Program Saracen Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Program Beach Head II Type Arcade **Price** £2.99 **Supplier** Americana, 8-10 Paul Street, London EC2A 4JH.

Bismarck

On the evening of 24th May 1941, HMS Hood took a direct hit in her magazine. Of the 1415 men on board, only 3 escaped with their lives. BISMARCK had claimed her first kill....



COMMODORE 64-128K

WARGAMES

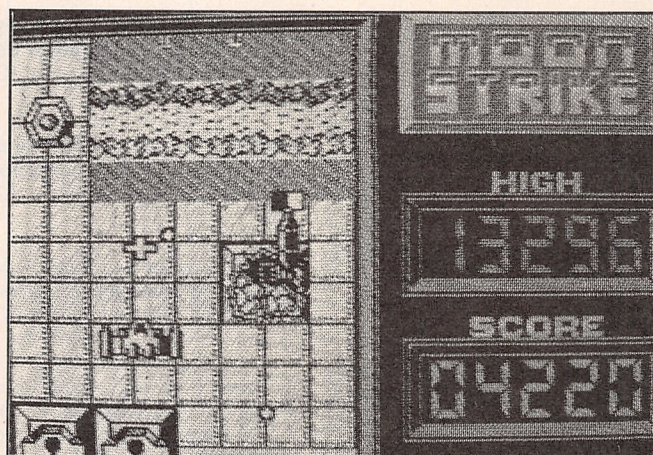
Program Bismarck Type Wargame **Price** £9.95 (£14.95 on disc) **Supplier** PSS, 452 Stoney Stanton Road, Coventry.

Program Annals of Rome Type Wargame **Price** £12.95 (£17.95 on disc) **Supplier** PSS, 452 Stoney Stanton Road, Coventry.

Program Dizzy Dice Type Fruit machine simulation **Price** £1.99 **Supplier** Players, Calleva Park, Aldermaston, Berks.

Program Scrabble Deluxe Type Board game **Price** £12.95 cassette (£15.95 on disc) **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX.

continued on page 60 ►



Moonstrike is a sedate little shoot 'em up, whose chief claim to fame is that some of the nasties that plummet down from the top of the screen are shaped like light bulbs. That aside, it is a competent but not outstanding addition to the massed ranks of zap games.

The format of the game is fairly standard; you fly a small spacecraft over the surface of a planet, which is divided into sectors, attempting to bomb a number of land targets at the same time as dodging or destroying the airborne weapons that are aimed at you. You are armed with two types of weapons, a laser mounted on your wing tips for air to air combat, and bombs for the ground targets. The bombs are aimed with a cursor which moves just in front of you, and pressing the fire button at the same time as pulling back on the joystick releases the bomb. At first, switching between the two weapons was a bit tricky, and caused a lot of lost lives, but you should soon get the hang of it.

The graphics are quite nice, not a lot of colour has been used but that has allowed the programmers to add a lot of detail to the graphics. However there are a few things which cause the game to fall short of shoot 'em up heaven. For a start, only half the screen is used as playing area (the other half is devoted entirely to the score table and Moonstrike logo, which is a bit of a waste) so you don't have very much room to manoeuvre in. And, as the ship doesn't move all that fast, it can get a bit frustrating finding yourself penned in as often as I did. (On one occasion, just as I passed into sector two, a huge '2' flashed onto the screen obscuring what was going on and causing me to get blown up.)

There's a problem with the laser too, as you can only have one set of shells on screen at a time (like the old Space Invaders), and if you miss a target you have to wait for the shell to go off the top of the screen before you can fire again, so you never really get to work up to the frantic pace of the best shoot 'em ups. So, while Moonstrike is a fairly professional effort, it doesn't quite reach the sheer speed and addictiveness that you might look for in this type of game.

Stephen Dean

Program Moonstrike Type Arcade **Machine** Spectrum **Price** £7.95 **Supplier** Mirrorsoft, Athena House, 66-73 Shoe Lane, London EC4P 4AB.

NEW RELEASES

◀ continued from page 59

Program Tunnel Vision Type Arcade
Price £2.99 **Supplier** Rack-It,
8-10 Paul Street, London EC2A
4JH.

Program Angleball Type Arcade
Price £2.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

Program Streetbeat Type Arcade
Price £1.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

Program Bosconian Type Arcade
Price £1.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

Program Wizard's Pet Type Ar-
cade **Price** £2.99 **Supplier** Master-
tronic, 8-10 Paul Street, London
EC2A 4JH.

Program Sunburst Type Arcade
Price £2.99 **Supplier** Hewson,
Hewson House, 56b Milton Trading
Estate, Milton, Abingdon, Oxon
OX14 4RX.

Program Motos Type Arcade **Price**
£2.99 **Supplier** Mastertronic, 8-10
Paul Street, London EC2A 4JH.

Program Ubik's Music Type Utility
Price £2.99 **Supplier** Firebird,
64-76 New Oxford Street, London
WC1A 1PS.

Program Solomon's Key Type
Arcade **Price** £8.99 **Supplier** US
Gold, Units 2/3, Holford Way, Hol-
ford, Birmingham B6 7AX.

Spectrum

Program Scrabble Deluxe Type
Board game **Price** £10.95 for 128K
cassette (£15.95 on +3 disc) **Sup-
plier** Virgin Games, 2-4 Vernon
Yard, Portobello Road, London W11
2DX.

**Program Game Set and Match
Type** Sports compilation **Price**
£12.95 (£17.95) **Suppliers** Ocean, 6
Central Street, Manchester M2 5NS.

Program Beach Head II Type Ar-
cade **Price** £2.99 **Supplier** Ameri-
cana, 8-10 Paul Street, London
EC2A 4JH.

Program Angleball Type Arcade
Price £2.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

Program Saracen Type Arcade
Price £2.99 **Supplier** Americana,
8-10 Paul Street, London EC2A
4JH.

Program Jet Pac Type Arcade
Price £1.99 **Supplier** Ricochet,
8-10 Paul Street, London EC2A
4JH.

Program Xevious Type Arcade
Price £2.99 **Supplier** Americana,

8-10 Paul Street, London EC2A
4JH.

Program Ocean Conqueror Type
Arcade **Price** £2.99 **Supplier** Rack-
It, 8-10 Paul Street, London EC2A
4JH.

Program Super Nova Type Arcade
Price £1.99 **Supplier** Players, Cal-
leva Park, Aldermaston, Berks.

Program Draughts Genius Type
Arcade **Price** £2.99 **Supplier** Rack-
It, 8-10 Paul Street, London EC2A
4JH.

Program Rescue Type Arcade
Price £1.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

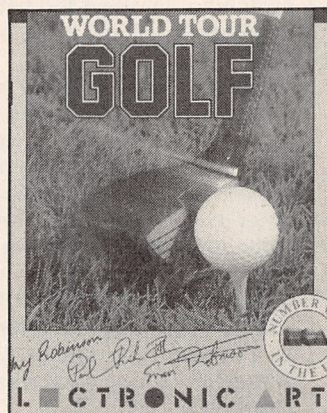
Program Bosconian Type Arcade
Price £1.99 **Supplier** Mastertronic,
8-10 Paul Street, London EC2A
4JH.

Program Car Wars Type Arcade
Price £2.99 **Supplier** Firebird,
64-76 New Oxford Street, London
WC1A 1PS.

Program Play It Again Sam Type
Arcade **Price** £2.99 **Supplier** Mas-
tertronic, 8-10 Paul Street, London
EC2A 4JH.

Program Pageant of Life Type
Board game **Price** £8.95 **Supplier**
Softfirm, 21 Ashbourne Way, That-
cham, Berks.

IBM PC and Compatibles



Program World Tour Golf Type
Sport simulation **Price** £19.95 **Sup-
plier** Electronic Arts, Langley Busi-
ness Centre, 11-49 Station Road,
Langley, Nr Slough, Berks SL3 8YN.

Program Arctic Fox Type Arcade
Price £19.95 **Supplier** Electronic
Arts, Langley Business Centre,
11-49 Station Road, Langley, Nr
Slough, Berks SL3 8YN.

Program Marble Madness Type
Arcade **Price** £19.95 **Supplier** Elec-
tronic Arts, Langley Business Cen-
tre, 11-49 Station Road, Langley,
Nr Slough, Berks SL3 8YN.

You can tell when Christmas is coming because all of last year's big hits start to crop up on compilations. The first of this year's batch arrived with Elite's 6-Pak Volume 2.

Out of the six games five are re-releases, while one, *Batty*, is unreleased. This isn't very surprising when you realise that *Batty* is actually a *Breakout* clone along the lines of *Arkanoid*. It has all the bonus features found in *Arkanoid* (slow ball, laser, extra lives) as well as the addition of a ball which turns into a fireball, destroying everything in its path. Unoriginal but enjoyable.

Another clone on the tape is Pandora's *Eagle's Nest*. This is one of the best of the recent *Gauntlet* clones, in fact it's so good and so recent that I'm surprised to find it on a compilation so soon. It puts the action in a World War II scenario rather than the usual fantasy setting, but the game is still good old *Gauntlet*.

ACE is about the oldest game on the tape. Flight simulators normally bore me silly, but this is more of an action game than a simulator so it's thumbs up for *ACE*. *Endurance's International Karate* is also one of the better examples of its type. You've got about sixteen different moves to master, so you'll need to be totally ambidextrous, but it's all good inscrutable fun if you can master it.

FTL's *Shockway Rider* is the only game that I'm not totally enthusiastic about. It's an odd game that reminds me of a sci-fi story I read ages ago. You are travelling along a series of moving walkways, some of which move at higher speeds. Your aim is to travel through twelve districts, fighting street gangs and dodging lanes.

On the other hand, the second FTL game, *Lightforce*, is probably the highlight of the compilation. This is far and away my favourite shoot 'em up of all time. It's fast, furious, colourful and totally wonderful.

Obviously the value of any compilation depends upon how many of the games you've already got. But if you don't already have these games then 6-Pak Vol. 2 is excellent value.

Stephen Dean

Program 6-Pak Volume 2 Type Compilation **Machine**
Amstrad CPC, C64, Spectrum **Price** £9.95 all cassettes
(£14.95 C64 and CPC disc) **Supplier** Elite, Anchor House,
Anchor Road, Aldridge, Walsall, West Midlands.

CHARTS

Top Twenty

1	(1)	Run for Gold	Alternative
2	(3)	BMX Simulator	Code Masters
3	(2)	Paperboy	Elite
4	(8)	Super Robin Hood	Code Masters
5	(9)	Cricket International	Alternative
6	(4)	Milk Race	Mastertronic
7	(7)	Destructo	Bulldog
8	(6)	Road Runner	US Gold
9	(11)	Soccer Boss	Alternative
10	(31)	Joe Blade	Players
11	(12)	World Class Leaderboard	Access-US Gold
12	(14)	Living Daylights	Domark
13	(13)	Barbarian	Palace
14	(32)	Decathlon	Firebird
15	(5)	Exolon	Hewson
16	(15)	International Karate	Endurance
17	(25)	Olympic Spectacular	Alternative
18	(22)	Back To The Future	Firebird
19	(37)	Tournament Leaderboard	Access-US Gold
20	(30)	ATV-Simulator	Code Masters

All figures compiled by Gallup/Computer Trade Weekly

THOUGHTS & CROSSES

(COMPUTERS) LTD.

33 MARKET STREET, HECKMONDWIKE, WEST YORKS

COMPUTERS

Acorn Archimedes 305/310/410/440	Phone
Amstrad CPC464 with colour mon. + free software	£299
Amstrad CPC6128 + colour monitor	£399
Amstrad PC1512 colour dual	£748
On site contract for above	£1229
Amstrad PC1512 colour 20MB HD	£1229
On site contract for above	£156
Amstrad PC1512 single colour	£631
On site contract for above	£31
Amstrad PC1512 mono dual	£573
On site contract for above	£28
Amstrad PC1512 mono 20MB HD	£1033
On site contract for above	£48
Amstrad PC1512 mono single	£458
On site contract for above	£22
Amstrad PC1640 EDO EGA colour HD20	£1378
On site contract for above	£1208
Amstrad PC1640 colour HD20	£1033
Amstrad PC1640 mono HD20	£1033
Amstrad PC1640 EDO EGA colour dual	£1033
On site contract for above	£48
Amstrad PC1640 colour dual	£861
Amstrad PC1640 mono dual	£868
Amstrad PC1640 EDO EGA colour single	£918
On site contract for above	£43
Amstrad PC1640 colour single	£746
Amstrad PC1640 mono single	£573
Amstrad PCW8256	£343
Amstrad PCW8512	£458
Amstrad PCW8512 daisywheel system	£1208
Atari 1040STF	£499
Atari 1040STF + SM125 monitor	£599
Atari 520STFM	£299
Atari 520STFM + mouse (1 only)	£215
Atari Mega ST2 + SM125	£649
Atari Mega ST4 + SM125	£1249
BBC Master 128	£425
BBC Master Compact green screen	£458
BBC Master Compact colour system	£631
BBC Master Compact + TV adaptor	£417
Commodore Amiga A500	£545
Please Phone for latest deals on above	
Spectrum +2 cassette	£139
Spectrum +3 disk drive	£199

PRINTERS

Canon PW1080A	£285
Canon A55 (141 2 Carriage)	£425
Citizen 1200 NLO	£179
Citizen MSP10E	£275
Citizen MSP 25E (141 2 Carriage)	£275
Epson LX80	£275
Epson LQ 800	£564
Citizen MSP15E (wide carriage)	£325
Panasonic KXP1081	£165
Amstrad DMP 3160	£165
Amstrad DMP 2000	£159

DAISY PRINTERS

Juki 6200	£549
-----------	------

PRINTER ACCESSORIES

Epson LX80 86 Tractor Unit	£25
Epson LX80 86 Sheet Feeder	£65
Juki 6100 6200 Tractor Feeder	£159
Juki 6100 6200 Sheet Feeder	£220
Citizen 1200 Sheet Feeder	£105

EXTERNAL CENTRONICS TYPE

Commodore 64 - Citizen 1200	£55
Kempston interface-E Rom based for Spectrum	£39.95
QL Centronics interface	£20
Tripler 20 64 for CB VIC20 64	£30

PRINTER RIBBONS

Amstrad PCW8256	£5.50
Brother EP44	£2.30
Brother HRS	£2.99
Brother M1009 Centronics GLP	£3.80
Canon Kaga Taxan	£5
CBM MPS801	£5
Citizen 1200	£5
DMP 2000 3000	£5
Epson LX80	£4.50
Epson MX FM RX80	£4
Juki 6100 Single strike	£2
Juki 6100 Multistrike	£5
Mannesman Tally MT80 MT80 Plus	£10
OKI Microline 80	£2.30
Qume Multistrike	£4.30
Sekosha GP100	£4.50
Shinwa CP80CPA80 SP80	£5
Star NL 10	£5

10 or more ribbons deducted 10%

Others available, please ask.
Also PRINT WHEELS available, please ask.

LEADS

Amstrad Centronics Printer Lead	£10
Apricot Centronics Lead	£10
Atari 520ST printer	£10
BBC Centronics Printer lead	£5
BBC Microvitec RGB	£5.95
BBC Serial RS232 Printer Lead	£5
Commodore Serial Lead	£5.95
Einstein Centronics Printer Lead	£10
IBM Printer Lead (Cable)	£10
Mannesman Centronics Printer Lead	£10
MSX Centronics Printer	£15
Opus Discovery Centronics Lead	£15
QL to RS232 Lead	£14.95
Waladine to Centronics Lead	£15
ZX Interface 1 to RS232 'D'	£14.95
RS232 'D' to RS232 'C'	£15

MONITORS

Amiga 1081 Colour Monitor	£380
Atari SM125	£120
Microvitec 1431 MS (Standard res)	£215
Microvitec 1451 MS (Medium res)	£269
Microvitec 1451 DQ Sinclair QL	£275
Philips 7502 anti-glare screen monitor (20MHz)	£32
Philips 7502 anti-glare amber screen monitor	£35
Philips 7542 anti-glare paper white monitor (20MHz)	£35
Philips 8833 RGB/TLU/Audio Med Res	£280

DISK DRIVES

Amstrad PCW 512k Upgrade + 720k Second Drive	£189
Atari SF354 5Mb Drive	£100
Atari SF314 1Mb Drive	£190
Cumana (Atari) 1Mb Drive	£139
QL 720K Drive + Interface	£199
QL Twin 720K Drive + Interface	£299
Amstrad FD-1 (Second Drive)	£39
Cumana CSX 400	£135
Commodore 1541C	£195
Cumana CD800S	£319
Commodore Amiga Disk Drive (Cumana) 1mb	£139

DISKETTES

5 1/4" SS DD 48 + pi	10 for £9
5 1/4" DS DD 48 + pi	10 for £9
5 1/4" DS DD 96 + pi	10 for £9
3" CF2	10 for £29
3 1/2" Single Sided	10 for £16
3 1/2" Double Sided	10 for £22

AMSTRAD PC PRODUCTS

10 MByte Hardcard + Controller Card (Dysan)	£349.00
30 MByte Hardcard + Controller Card (Storage Master)	£399.00
FD-3 Second Disk Drive	£199.95
Hard Disk Backup Unit (including Cartridge)	£530.00

PSION ORGANISER PRODUCTS

Organiser 11 CM (8K Ram/632K Rom)	£39
Organiser 11 XP (8K Ram/32K Rom)	£39
Datapack 16K Ram Upgrade	£19
Datapack 32K Ram Upgrade	£34
Datapack 64K Ram Upgrade	£59
Comms Link (RS232) - PC	£58
Link Up Adaptors	£12
Mouse Adaptor	£12.95
Formatter	£42

ATARI ST SOFTWARE

Crystal	Antic	£22.50
GFL Football	Activision	£22.50
Music Studio	Activision	£26.95
CAD 3D	Antic	£45.00
Print Master	AmiSoft	£26.95
Fast Comm	Atari	£45.00
Back Pack	Co.puter Concepts	£45.00
Fast Basic	Computer Concepts	£45.00
GFA Basic	Glentop	£54.00
GFA Basic Compiler	Glentop	£54.00
1st Word Plus	GST	£72.00
Devpac	Hisoft	£44.95
Saved	Hisoft	£22.50
Fast Basic (Disk)	Computer Concepts	£40.00
Beauracuity	Infocom	£31.50
Enchanter	Infocom	£28.95
Hitch Hikers Guide to Galaxy	Infocom	£28.95
Hollywood Hijinx	Infocom	£28.95
Leather Goddesses of Phobos	Infocom	£28.95
Sorcerer	Infocom	£28.95
Spellbreaker	Infocom	£28.95
Wishbringer	Infocom	£28.95
Prohibition	Infocom	£18.00
K Spread 2	Kuma	£72.00
Megamax C	Megamax	£140.00
Assembler	Metacomco	£45.00
Cambridge Lisp	Metacomco	£90.00
Lattice C	Metacomco	£135.00
Make	Metacomco	£45.00
MCC Pascal	Metacomco	£45.00
Menu +	Metacomco	£91.00
Soldat	Metacomco	£18.00
Balance of Power	Microdeal	£22.50
Art Director	Mindscape	£26.95
Fleet Street Editor	Mirrorsoft	£45.00
Mercenary Compendium	Novagen	£22.50
Chess	Pison	£22.50
Jewels of Darkness	Rainbird	£18.00
Silicon Dreams	Rainbird	£18.00
Starglider	Rainbird	£22.50
The Pawn	Rainbird	£22.50
Accountant	Sage	£192.00
Accountant Plus	Sage	£206.00
Book Keeper	Sage	£102.50
Roadwar 2000	Strategic	£22.50
Flight Sim 2	Sublogic	£45.00
Trinbase	Talent	£81.00
Printmaster Gallery I	Unison	£22.50
Leaderboard	US Gold	£22.50
Leaderboard Tournament	US Gold	£8.95
Silent Service	US Gold	£22.50
Ultima 3	US Gold	£22.50
Winter Games	US Gold	£22.50
VP Professional Gem	VP Tech	£199.50
Barbarian	Psychoid	£22.50
Road Runner	US Gold	£22.50
Arctic Fox	Electronic Arts	£35.95
Pirates of Barbary Coast	Cascade	£11.95

AMSTRAD PC 1512/IBM COMPATIBLE SOFTWARE

ACCOUNTING SOFTWARE	Camsoft	£122.00
Financial Manager		

Payroll	Camsoft	£41.00
Bookwork	Camsoft	£162.00
Money Manager Plus	Connect	£33.00
Easy Accounting	DAC	£90.00
Easy Mate	DAC	£47.00
Easy Tutor	DAC	£26.00
Integrated Accounts	MAP	£122.00
Sales Ledger & Invoicing	MAP	£41.00
Sales & Marketing	MAP	£81.00
Magic	MAP	£91.00
Nominal Ledger	MAP	£41.00
Purchase Ledger	MAP	£41.00
Stock Control	MAP	£41.00
Payroll	MAP	£41.00
Maps (SSP System)	MAP	£41.00
Sales Order Entry	MAP	£37.00
Purchase Order Entry	MAP	£37.00
Job Costing	MAP	£91.00
Book Keeper	Sage	£35.00
Accountant	Sage	£139.00
Accountant Plus	Sage	£186.00
Financial Controller	Sage	£279.00
Payroll	Sage	£95.00
Accountability	Migent	£95.00

ADVENTURE GAMES

Carmen Sandiego	Broderbund	£27.00
Do-Tapes	Polarware	£13.50
The Grimmon Crown	Polarware	£13.50
Transylvania	Polarware	£13.50
Sierra	Sierra	£18.00
Sierra	Sierra	£18.00
Wizard Crown	S.S.I.	£22.50

BUSINESS PRODUCTIVITY

ABC (Complete Business)	ABC	£140.00
Homebase	Amber	£57.00
Reflex (PC 1512 only)	Amsoft	£57.00
Sidekick	Amsoft	£27.00
Dominio	Amsoft	£91.00
Abie One	Conceptdata	£41.00
Hal	Lotus	£81.00
Ability Plus	Migent	£189.00
Moneypower	Moneywise	£81.00
PC Four	Pison	£65.00
Fastack	Sage	£65.00
Portex System	Showings	£99.00
Open Access 1 Entry	SPI	£122.00

COMMUNICATIONS

Chitchat	Sage	£95.00
----------	------	--------

DATABASES

Cambase	Camsoft	£41.00
Delta 4.3	Camsoft	£91.00
Dac-Base	DAC	£41.00
Superbase Personal (Gem)	Precision	£91.00
Retrieve	Sage	£95.00
GBase (Gem)	SPI	£81.00
SSI Data	SSI	£183.00
Tas Plus	Tas	£93.00

ENTERTAINMENT SOFTWARE

ADVENTURE GAMES	Activision	£22.50
Portal	Activision	£18.00
Dragonworld	AudioLogic	£18.00
Fahrenheit 451	AudioLogic	£18.00
Nine Princes in Amber	AudioLogic	£18.00
Daylight	Infocom	£27.00
Enchanter	Infocom	£21.00
Enchanter Invisibles	Infocom	£6.95
Hitchhikers Guide to Galaxy	Infocom	£26.00
Leather Goddesses of Phobos	Infocom	£27.00
Minotaur	Infocom	£27.00
Planetfall	Infocom	£21.00
Seastalker	Infocom	£21.00
Trinity	Infocom	£31.00
Wishbringer	Infocom	£26.00
Zork 1	Infocom	£21.00
Zork 2	Infocom	£21.00
Zork 3	Infocom	£21.00
Jewels of Darkness	Rainbird	£18.00
Silicon Dreams	Rainbird	£18.00
Ultima III	US Gold	£18.00
Bureaucracy	Infocom	£31.00
Stationfall	Infocom	£27.00
Passengers in Wind	Infocom	£22.50
Lord of Rings	Infocom	£22.50
ARCADE GAMES	Melbourne	£18.00
GBA Championship Basketball	Activision	£22.50
Alex Higgins Snooker	Amsoft	£18.00
Mean 18 Golf	Amsoft	£18.00
Pinball Construction	Amsoft	£18.00
Pistop II	Amsoft	£18.00
Summer Games II	Amsoft	£18.00
Winter Games	Amsoft	£18.00
World Games	Amsoft	£18.00
Super Sunday	Epyx	£22.50
Great Escape	Nexus	£18.00
Top Gun	Ocean	£18.00
AM FM Trivia 1	PC Leisure	£9.00
AM FM Trivia 2	PC Leisure	£9.00
Starglider	Rainbird	£18.00
Initiator	US Gold	£22.50
Rock 'n' Wrestle	Melbourne	£18.00
Strip Poker	US Gold	£18.00
World Series Baseball	Imagine	£18.00
STRATEGY SIMULATION	Activision	£22.50
GFL Championship Football		

Cyrus II Chess	Amsoft	£18.00
Destroyer	Epyx	£22.50
Conflict in Vietnam	Microprose	£22.50
Crusade in Europe	Microprose	£22.50
Decision in the Desert	Microprose	£22.50
F15 Strike Eagle	Microprose	£20.00
Helicat Ace	Microprose	£16.00
Silent Service	Microprose	£22.50
Solo Flight	Microprose	£18.00
Spirit Ace	Microprose	£16.00
Flight Simulator (Single)	Microsoft	£45.00
Flight Simulator Jet Scenery Disks 1-6	Microsoft	£93.00
Balance of Power	Mindscape	£27.00
Chess	Pison	£22.50
Checkmate	Robotek	£13.50
Jet	Sublogic	£43.00
Bridge Player 2000	CP Software	£17.95
Gettysburg	S.S.I.	£27.00
Battle of Antietam	S.S.I.	£27.00
Gettysburg	S.S.I.	£27.00

OTHERS

Music Studio	Activision	£22.50
Music Construction	Amsoft	£18.00

GEM SOFTWARE

Gem Diary	Digital Research	£31.00
Gem Draw	Digital Research	£31.00
Gem Draw Business Library	Digital Research	£31.00
Gem Font Editor	Digital Research	£31.00
Gem Fonts & Drivers	Digital Research	£31.00
Gem Graph	Digital Research	£31.00
Gem Programmers Toolkit	Digital Research	£145.00
Gem Word Chart	Digital Research	£31.00
Gem Write	Digital Research	£31.00

SPREADSHEETS

Supercalc 3	Amsoft	£63.00
Logistix	Grafax	£93.00
K Spread 2	Kuma	£65.00
Words & Figures	Lifetree	£93.00
VP Planner	Paperback	£91.00
PC Planner	Sage	£93.00
Math Plan	SSI	£350.00
Lotus 123	Lotus	£310.00

Of mice and men

As a regular reader of *Popular*, I could hardly fail to notice its enthusiasm regarding the Atari ST computer. Feeling the need to upgrade from my Sinclair Spectrum, I was also very interested in it, and finally bought a 520STFM and SC1224 colour monitor a few months ago. Potential purchasers may be interested in my verdict:

Every computer has its faults and dare I be the first (!) to publicise those of the ST in *Popular*.

I was slightly disappointed with the GEM operating system, but only because I've been spoiled by the Macintosh (which I have access to at University). It is a shame that DR did not take time to improve on the desktop concept (which I am sure is possible), instead of producing an imitation which is not as comprehensive. For example, icons cannot be repositioned within a window and file names are restricted to eight letters with an three letter extension. Double clicking requires daily finger exercises unless you copy the control panel accessory onto every disc to slow the mouse down. These are minor gripes however: GEM is an effective WIMP environment and makes the ST one of the most friendly home computers around.

Another minor gripe: there may be 512 colours available, but a large number of these are extremely similar shades of red or green. Although having two buttons on the mouse is an unforgivably daft idea, you do get used to it since most software designers with their heads screwed on only use one of them (the left). But the right button is there, and those without their heads screwed on can easily fall into the trap of using it (eg *Neochrome*). Sometimes, as in the case of *Arena* (an athletics simulation), the programmers seem to have no idea what the mouse is there for, and the user is

at first completely baffled by the menus which need to be double clicked.

But, let's face it, the best thing about the ST is its price. It is cheaper now than many 8-bit computers (Commodore 64 + Disk drive, BBC); and yet infinitely more powerful. My niggles about the operating system are really a wider criticism of all operating systems: even the Mac is frustrating at times, and a breakthrough in artificial intelligence is required to make a computer more friendly than that. Manufacturers I think should spend more time and effort on the "man/machine interface" as well as the hardware, since this is one program which will be used regularly by everyone who buys the computer. Even though I can't afford a Macintosh, Apple remains my favourite computer company. As you read this, Apple programmers are using the Cray Supercomputer to design the operating environment for their next generation of computers; while Atari is meddling with the Immos Transputer for the ultimate in speed; the operating system may be a last minute consideration. Acorn also has designed the fastest micro around, but hastily botched in a Wimp written in Basic; the hardware of the Archimedes can support a much more advanced system to control it.

The ST is an important machine because it ducks under the price point beyond which the British Public wouldn't buy it. Machines as powerful as this have been around for years, but only now have they entered the home computer niche. Atari have made a big step forward for the computer industry because people will look over our shoulders and see that computers have become friendlier since the Sinclair Spectrum days. Perhaps there is another home computer boom in the offing?

Andrew McOwan

This week, due to overwhelming demand, we have decided that it is about time to launch a new puzzle.

And it has also been decided that the best people to think of a new format for the puzzle would be you, the readers.

So, in essence, this week's puzzle is to think of a puzzle; which will start the week after next.

As with all other puzzles, the person who invents the most interesting format for the new puzzle (phew this is getting confusing, Ed!) will receive a prize, which for this special case will be £20.

Because this is such an important decision, we have decided to run this 'design a puzzle' competition for two weeks, so the closing date is October 16.

Send all your ideas to Puzzle Ideas, *Popular Computing Weekly*, Greencoat House, Francis Street, London SW1P 1DG.

HACKERS

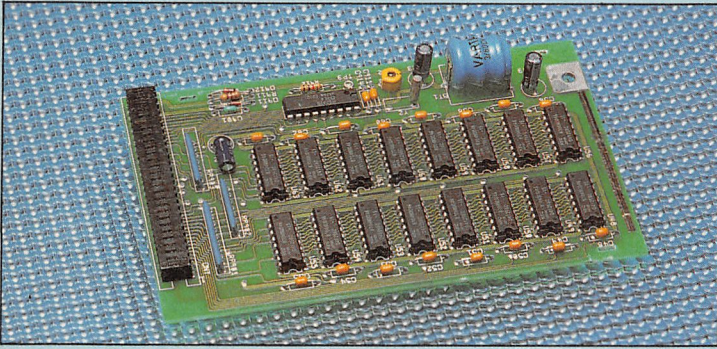


DATTEL ELECTRONICS

EXTERNAL 3.5" DISK DRIVE

- Slimline 1 Meg suitable for A500 or 1000
- Top quality NEC drive mechanism
- Throughport for Daisychaining other drives
- Attractively styled ● Complete — No more to buy
- 12 months guarantee ● Fully compatible

ONLY £114.99 POST FREE
ADD (£5 for next day Courier delivery).



512K RAM EXTENSION ● A500

- Available with/without calendar clock option
- Simply plugs internally into a A500 slot
- Fitted in minutes — no soldering etc.
- With calendar/clock onboard time/date automatically booted
- Battery backed to retain time/date

ONLY £79.99 FOR STANDARD 512K CARD OR

ONLY £89.99 FOR VERSION WITH CLOCK/CALENDAR

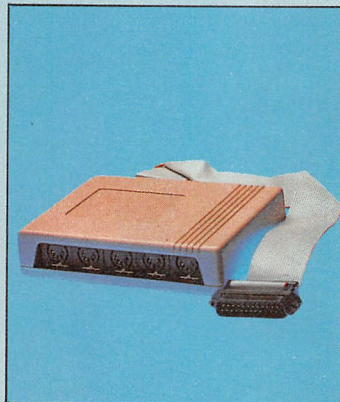


MARAUDER II

- Quite simply the best disk copier available for the Amiga (all models)

- ❑ Superfast disk copier will copy almost any commercial disk
- ❑ Friendly user Interface — Mouse driven throughout.
- ❑ Completely compatible with Amiga multitasking system
- ❑ Even decrypts many encoded programs including D.Print/Video/ Paint/Musio/II etc.
- ❑ Special 'Strategy Files' cope with even the most advanced protection schemes
- ❑ Supports upto 5 drives simultaneously for multiple copies
- ❑ Regular updates available — we always ship the latest
- ❑ Fast operation — typically around 80 seconds
- ❑ USA's top selling copier

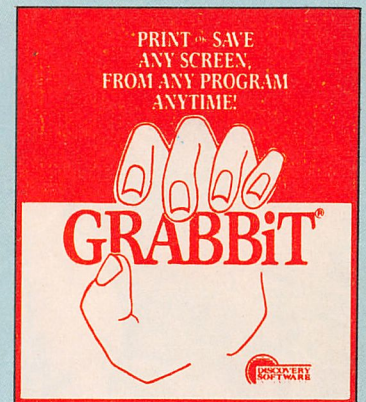
ONLY £29.99 POST FREE



MIDIMASTER

- Full Midi Interface for A500/2000/1000 (Please state model)
- Compatible with most leading Midi packages (inc. D/Music)
- Midi In — Midi Out x 3 — Midi Thru
- Fully Opto Isolated
- No need to pay more — Full Midi standard

ONLY £34.99



GRABBIT

- Grabbit is a transparent Screen Grabber program
- Always there — simple key operation
- Drives dozens of Printers
- Requires only 10K Ram
- A true productivity tool!
- Very quick operation — does not require screen on during printing
- Free "ANYTIME" program lets you update your own colour palette preferences.

ONLY £21.99 POST FREE

ALL ORDERS NORMALLY DESPATCHED WITHIN 48 HRS

HOW TO ORDER

BY PHONE

0782 273815
24 hr Credit Card Line

BY POST

Send cheques/POs made payable to 'Datel Electronics'

BY PRESTEL/FAX

Prestel Pages # 25880000A

Fax Orders
0782 264510

DATTEL ELECTRONICS

**UNITS 8/9, DEWSBURY ROAD, FENTON INDUSTRIAL ESTATE,
FENTON, STOKE-ON-TRENT**

**SALES ONLY
0782 273815**

**TECHNICAL ONLY
0782 202258**

GRY ZOR

Konami®

AN ARCADE NIGHTMARE NOW FOR YOUR HOME-MICRO



ocean

SPECTRUM
7.95

COMMODORE
8.95

AMSTRAD
8.95

Ocean Software Limited
6 Central Street • Manchester • M2 5NS • Tel: 061 832 6633 • Telex: 669977